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Observations on the Application of Coal Gas to the Purposes of Illumination. By WILLIAM THOMAS BRANDE, F. R. S. L. and E. Prof. Chem. R. I. &c.

[From the Journal of Science and the Arts, No. I. 1816.]

THE employment of the gases evolved during the destructive distillation of common pit coal for the illumination of streets and houses, is a subject of such intrinsic and increasing importance, as to render some account of its progress and improvement a proper subject of discussion in this Journal.

That coal evolves a permanently elastic and inflammable aeriform fluid seems first to have been experimentally ascertained by the Rev. Dr. Clayton, and a brief account of his discovery is published in the Philosophical Transactions for the year 1739. The following is an extract from his paper. "I got some coal, and distilled it in a retort in an open fire. At first there came over only phlegm, afterwards a black *oil*, and then likewise a *spirit* arose, which I could no ways condense; but it forced my lute, or broke my glasses. Once when it had forced my lute, coming close thereto in order to try to repair it, I observed that the spirit which issued out caught fire at the flame of the candle, and continued burning with violence as it issued out in a stream, which I blew out and lighted

again alternately, for several times. I then had a mind to try if I could save any of this spirit, in order to which I took a turbinated receiver, and putting a candle to the pipe of the receiver whilst the spirit arose, I observed that it catched flame, and continued burning at the end of the pipe, though you could not discern what fed the flame. I then blew it out, and lighted it again several times; after which I fixed a bladder, squeezed and void of air, to the pipe of the receiver. The oil and phlegm descended into the receiver, but the spirit still ascending blew up the bladder. I then filled a good many bladders therewith, and might have filled an inconceivable number more, for the spirit continued to rise for several hours, and filled the bladders almost as fast as a man could have blown them with his mouth: and yet the quantity of coals distilled was inconsiderable.

"I kept this spirit in the bladders a considerable time, and endeavoured several ways to condense it, but in vain. And when I had a mind to divert strangers or friends, I have frequently taken one of these bladders, and pricking a hole therein with a pin, and compressing gently the bladder, near the flame of a candle, till it once took fire, it would then continue flaming till all the spirit was compressed out of the bladder: which was the more surprising, because no one could discern any difference in the appearance between these bladders, and those which are filled with common air.

"But then I found that this spirit must be kept in good thick bladders, as in those of an ox or the like; for if I filled calves' bladders therewith, it would lose its inflammability in twenty-four hours, though the bladders became not relaxed at all."

But the application of the gas thus generated to the purposes of economical illumination, is of much more recent date, and the merit of introducing it is principally due to Mr. M[illegible]doch, whose observations upon the subject are published in the Philosophical Transactions for 1808. He first tried it in Cornwall, in the year 1792; and afterwards in 1798 established an apparatus upon a more extended scale at Boulton and Watts' foundry at Birmingham; and it was there that the first public display of gas lights was made in 1802, upon the occasion of the rejoicings for peace. These, however, were but imperfect trials,

when compared with that made in 1805 at Messrs. Philips and Lee's cotton mills at Manchester; and upon the results of which, all subsequent procedures, with regard to gas lighting, may be said to be founded. The whole cotton mill, with many adjacent buildings, were illuminated with coal gas to the exclusion of lamps, candles, and other sources of artificial light. Nearly a thousand burners of different forms were employed; and the light produced was estimated equal to that of 2500 well managed candles of six to the pound.

The most important and curious part of Mr. Murdoch's statement, relates to the cost of the two modes of lighting (namely, by gas and candles,) per annum. The cost of the coal used to furnish the gas, amounting annually to 110 tons, was 125*l.* Forty tons of coals to heat the retort, 20*l.* and the interest of capital sunk, with due allowance for accidents and repairs, 550*l.* From the joint amount of these items, must be deducted the value of seventy tons of coke, at 1*s.* 4*d.* per cwt. amounting to 93*l.* which reduces the total annual expense to 602*l.*; while that of candles to give the same light, would amount to 2000*l.*

Such was the flattering result of the first trial of gas illumination upon a tolerably extensive scale. In regard to its efficacy, we are informed by Mr. Murdoch, that the peculiar softness and clearness of the light, with its almost unvarying intensity, brought it into great favour with the work people; and it being free from the inconvenience of sparks, and the frequent necessity of snuffing, are circumstances of material importance, as tending to diminish the hazard from fire, to which cotton mills are so much exposed.

When Mr. Lee was examined by Mr. Brougham, in 1809, before a committee of the House of Commons, against the Gas Light and Coke Company's bill, his evidence was then equally favourable. He said, it gave no disagreeable smell; and when questioned as to the purity and goodness of the light, "I burn it," said he, "every night in my own house, instead of thirty pairs of candles." He further added, that he found it perfectly wholesome, and that it was never complained of either in his own dwelling house, or in the mill.

The President and Council of the Royal Society proved the

high opinion which they entertained of the value and importance of Mr. Murdoch's communication on the employment of the gas from coal for the purpose of illumination, by adjudging to him Count Rumford's gold and silver medals.

To prove that gas is economically applicable upon a small as well as a large scale, reference might be made to Mr. Cook's statement in the Phil. Mag. Dec. 1808, which, with some other amusing particulars, is noticed in the Edinburgh Review, vol. XIII. page 477.

I have thought it right to state these particulars concerning the earliest trials of gas lights: and now, without adducing further evidence from those remote sources, shall proceed to information gained at the establishments lately instituted in the metropolis; and to that afforded by my own experiments. The apparatus required for gas illumination, consists of retorts for the distillation of the coal, of condensers for the reception of the tar and ammoniacal liquor, of purifiers containing cream of lime, through which the gas passes, and is freed from carbonic acid and sulphuretted hydrogen; of gasometers or reservoirs with their main conduit pipes, and of the burners with their tubes and stop-cocks. Of the construction and expense of the whole of this apparatus, a tolerably correct estimate may be formed by consulting Mr. Accum's "Practical Treatise on Gas Light."

We are indebted to Dr. Henry, of Manchester, for some valuable researches, concerning the composition of the aeriform products of several varieties of coal. (Phil. Trans. 1808.) He has pointed out the various composition of the gas at different periods of the distillation, and has shewn the important influence of the circumstances under which the coal is distilled, upon the proportion of gas yielded, and its fitness for the purposes of illumination. This fact has lately attracted the notice of Mr. Clegg, the engineer of the Gas Light Company, who has founded upon it several ingenious improvements in the construction of the retorts employed at the Westminster gas works. Coal in large heaps, and gradually heated, affords less gas and more water and tar, than when it is extended over a considerable surface, and suddenly brought to a red heat. It

is also very advantageous to dry the coal before its introduction into the retort.

In a small gas apparatus, erected in the laboratory of the Royal Institution, we find that 4 lib. of good Newcastle coal, introduced into the retort previously heated red, in a shallow iron pan, may be made to afford a produce of from twenty to twenty-six cubic feet of gas, consisting of

8	Olefiant gas
72	Carburetted hydrogen
13	Carbonic oxide and hydrogen
4	Carbonic acid
3	Sulphuretted hydrogen
100	

The carbonic acid and sulphuretted hydrogen are separated by the lime in the purifiers.

The same quantity of coal introduced into the cold retort and gradually heated, afforded only twenty-two cubic feet of gas, consisting of

5	Olefiant gas
70	Carburetted hydrogen
18	Carbonate oxide and hydrogen
6	Carbonic acid
1	Sulphuretted hydrogen
100	

The specific gravity of the former gas, that of air being = 1000, was = 560, and of the latter = 555: the fitness of gases for the purposes of illumination is, generally speaking, directly as their specific gravity.

These experiments lead to the conclusion that a chaldron of good Wallsend Newcastle coals would afford from 17,000 to 20,000 cubical feet of gas, but the process of distillation as now carried on in the large establishments for lighting the metropolis seldom affords a larger average produce than 12,000 cubical feet. There can, however, be little doubt, that by improvement in the construction and management of the retorts, the highest of the above averages might be procured; and calculating upon this produce of gas, and upon the other substances

yielded by the operation, we obtain a curious and striking result.

The average value of a chaldron of the best Newcastle coals is = 3*l.* The value of the products of its distillation is as follows:

	l.	*s.*	*d.*
1¼ chaldron of coke, at 31*s.* - - - - - - - - -	1	18	9
12 gallons of tar, at 10*d.* - - - - - - - - - -	0	10	0
18 gallons of ammoniacal liquor, at 6*d.* - - - -	0	9	0
20,000 cubic feet of gas, at 15*s.* per 1,000 cub. feet,	15	0	0
l.	17	17	9

From the value of products must of course be deducted the value of the common coal employed in the furnaces for heating the retorts, amounting to about five chaldrons for every five and twenty chaldrons submitted to distillation, and the expense incurred by wear and tear, with the wages of the labourers, and lastly, the interest upon capital. Mr. Murdoch's estimate, already quoted, will be found pretty accurate upon these heads.

The tar is frequently employed for the production of gas, either by mixing it with small coal in the retorts, or by passing it through a red hot tube. Every pound yields between seventeen and eighteen cubic feet, containing from fifteen to twenty per cent. olefiant gas. When, therefore, it has been cleansed by lime, it burns with a very brilliant flame, and is a most improving addition to the common gas. Wigan and Cannell coal yield the best and largest proportion of gas for the purposes of illumination, but it is seldom it can be employed on account of its high price.

The burners, or tubes whence the gas issues for combustion, may be infinitely and tastefully varied. The varieties commonly employed are the bat's-wing burner, and the Argand burner. The former consists of a brass tube having a slit at its extremity about a quarter of an inch long and one-fortieth of an inch wide. The latter is composed of two concentric brass tubes about two inches long, closed at bottom by a ring of brass, and at the top by one of steel perforated with sixteen or eighteen holes of one-thirtieth of an inch in diameter. The gas

enters the cavity between the tubes, and issues from the circular row of apertures, where it is inflamed, and having a due supply of air within and without, burns very beautifully when a proper glass is placed over the burner. These burners, when very carefully regulated, consume about three cubical feet of gas per hour, and give light equal to that of six wax candles; but it is requisite, on account of carelessness and mismanagement, to allow four cubical feet to each burner per hour. The bat's-wing burner should not consume more than three cubic feet per hour.

At the three stations belonging to the chartered Gas-light Company, situated in Peter-street, Westminster, in Worship-street, and in Norton Falgate, twenty-five chaldrons of coals are carbonised daily, which actually yield 300,000 cubical feet of gas, equal to the supply of 75,000 Argand's lamps, each lamp giving the light of six wax-candles. But if the full proportion of gas were obtained, viz, 20,000 cubical feet from each chaldron of coals, then the produce should be 500,000 cubical feet, equal to the supply of 125,000 lamps of the same size, and the light afforded should equal that of 750,000 wax candles, instead of 450,000, which is the real produce.

At the City gas-works, in Dorset-street, Blackfriars-bridge, the daily consumption of coals, for distillation, amounts, at present, to three chaldrons; which afford gas for the supply of 1,500 lamps, so that the total consumption of coals daily in London, for the purpose of illumination, amounts to twenty-eight chaldrons, and the number of lights supplied to 76,500.

Besides the different varieties of coal, some of which, as has been hinted, are much preferable to others, and coal-tar, an useful gas may be procured from a variety of other substances; and in the laboratory of the Royal Institution we often feed the retort with waste paper, saw-dust, pieces of wood, &c. and consume the gas for a variety of purposes, where oil was formerly employed.

The following are the results of some experiments upon these subjects, compared with the produce from coal.

1. The retort was charged with four pounds of coal. The quantity of gas amounted, after having passed the purifiers, to

twenty cubic feet. The coke remaining in the retort weighed 2 lb. 8.7 oz.

The heating power of the gas flame was compared with that of a wax candle, by ascertaining the time required by each to raise two ounces of water, in a thin copper vessel, from 55° to 212°. The flames were made as similar in dimensions as possible, and so placed that their points just touched the bottom of the vessel. The heating power of the candle being assumed as = 1. that of the coal gas flame was = 1.5.

2. Four pounds of the dried wood of the common willow yielded sixteen cubical feet of gas, and fourteen ounces of charcoal remained in the retort. The gas burned with a very pale blue flame, and was unfit for the purpose of illumination, and contained no olefiant gas.

3. Four pounds of the wood of the mountain ash afforded fifteen and a half cubical feet of gas, and thirteen ounces and a half of charcoal. The flame was very pale and blue.

4. Four pounds of white birch wood gave fourteen cubical feet of gas and twelve ounces of charcoal. The flame similar to 2 and 3.

5. Four pounds of hazle wood yielded thirteen cubical feet and a half of gas, and twelve and a half ounces of charcoal. Its heating power was = 1.2. It burned with a better flame than 2, 3, and 4, but the intensity was not sufficient for any useful purpose of illumination.

6. Four pounds of writing paper gave eighteen cubical feet of gas, and the remaining charcoal, which beautifully retained the form and texture of the paper, weighed eleven ounces and a half. The heating power of the gas was = 1.6. It burned with a flame nearly approaching, in illuminating power, to that of coal gas.

These experiments, along with others which it is thought unnecessary to notice, prove that the gas from woods is not fit for the purposes of illumination, although, as evolved during the production of charcoal, it may conveniently be consumed in the laboratory as a source of heat.

Respecting the advantages of gas illumination in streets, open places, large manufactories, &c. there can be but one opinion; but its introduction into dwelling-houses involves some more

important considerations. It may be urged in its favour, that the light is more equable, beautiful, and agreeable to the eye than that obtained from any other source; that superior cleanliness is attained, and the troublesome operations of filling and trimming oil lamps are superseded; that there is no danger from sparks and snuffs, as where candles are employed, and that by closing the main pipe of supply, a certain extinction of all the lights throughout the building is insured.

The following are the principal objections that have been adduced. When the gas escapes unburned, its smell is extremely disagreeable, and this may happen either from some fault in the pipes or burners, or from a stop-cock connected with a burner being accidentally left open. In the latter case the remedy is obvious, but in the former the escape of gas may prove very troublesome; but it may be guarded against by employing double pipes, by carrying them as much as possible upon the exterior of the house, and above all, by employing careful and good workmen in the construction of every part of the apparatus.

The idea of explosions, in rooms lighted by gas, has frequently occurred; but when the probability of such an event is calmly considered, much of the alarm that it has excited must vanish. For the formation of an explosive atmosphere, a large quantity of gas must escape into an apartment which must be nearly air-tight; and in a room with an open chimney, and two or three doors and windows, it would scarcely be possible to obtain a dangerous mixture, though it might occur in a cellar or any other very small and close apartment. In a dwelling room the gas would announce itself by its smell, very long before any dangerous mixture could ensue, and the quantity of gas required would be very great. A room twelve feet square, or containing 1728 cubical feet of atmospheric air, would require an addition of 247 cubical feet of coal gas to render its atmosphere explosive. If we suppose a large Argand's burner accidentally left open in this apartment, whence gas is flowing at the rate of 4 cubical feet per hour, it would require 62 hours for the above quantity of gas to flow into the room, which also must be *nearly* air-tight; these circumstances can scarcely be supposed ever to occur; a very little attention to ventilation,

which whenever gas is used should be strenuously insisted on, would remove all possibility of danger. But the best proof of the safety of gas illumination is, that notwithstanding the many thousand lamps nightly burning in London, six* accidents only are known to have occurred, and those of a very trifling and almost unimportant nature, though the pipes and lamps are generally badly and very carelessly managed. In matters of this kind, facts, and not arguments, must be looked to for evidence.

It was my intention to have concluded this paper with some observations on the construction of burners, and with an account of several important improvements lately made in the general apparatus by Mr. Clegg: the hope of rendering my account of these subjects more correct and perfect than is at present in my power, induces me to defer it till the appearance of the next number of this Journal.

Observations on the Nature and Properties of Caoutchouc, and on the Construction of Elastic Beds, Pillows, Hammocks, &c.

[From the London Monthly Magazine, for March, 1816.]

The term *Caoutchouc* may be considered as the *generic name* for a concrete vegetable substance which possesses the properties of elasticity and extensibility, and is soluble in the essential oils, &c.; and its not being acted on by those fluids which are solvents for gums and resins, renders the term elastic *gum*, or elastic *resin*, improper for it. The *specific name* may be that of the vegetable producing it: as, caoutchouc of *Urceola elastica*, caoutchouc of *Ficus indica*, caoutchouc of *Artocarpus integrifolia*, &c.

This production is common to the East-Indies, and to all tropical climates, from whence it is imported in various artificial forms; chiefly in that of bottles and solid blocks; sometimes in the shape of balls, or in the rude figures of birds, horses,

* Two of these arose from holes having been mischievously bored in the pipes of supply.

and other animals. It grows very abundantly in South America, particularly on the banks of the Amazon river, eastward of Quito; also in the colonies of Surinam and Cayenne, in Guiana; and has been found plentifully in Brazil, and in small quantities near Buenos Ayres, and beyond the river Plata at near 40 degrees South latitude, or 16 degrees beyond the tropics: so that it may possibly be propagated in Spain, or in the South of France, as these are both situated under the corresponding degree of North latitude: and there are some English trees and plants affording a white juice, which, if collected in sufficient quantities, may possibly produce by coagulation a similar elastic substance.

Caoutchouc, as an article of commerce, is of comparatively modern introduction; its uses have been locally confined, and but little known; whilst its great abundance, and the easy mode of its being obtained and applied, renders it an advantageous subject of general investigation: and the principal object herein is to collect and arrange a series of well authenticated facts relating to it; and, from the inferences deducible therefrom, to elucidate and confirm the advantages of its application to numerous and more extensive purposes. I have therefore subjoined abstracts from the accounts of M. de la Borde, physician at Cayenne, in Guiana, &c. and also from the following works:

Linnæus. *Spec. Plant.* SIPHONIA CAHUCHU.
——— *Suppl.* JATROPA ELASTICA.
Aublet. *Guian.* II. *Pl.* 335. HEVEA GUIANENSIS.
Annales de Chimie. 1792.
Act. Par. 1751. *Pl.* 20, *figura mala.* PAO XIRINGA.
Nouv. dict. d'Hist. Nat. IV. *p.* 308. *Pl. B.* 1. *fig.* 4.
Asiatic Researches, Vol. 5. ELASTIC GUM VINE, URCEOLA ELASTICA.
Encyclopedia. Nicholson. CAOUTCHOUC.
——— *Londinensis.* CAOUTCHOUC, URCEOLA ELASTICA.
General Review of Foreign Literature, 1775.
Repertory of Arts, CAOUTCHOUC.
Chemic. Dict. Nicholson. CAOUTCHOUC.
Acropedia. Baldwin. COCHUC.

The French naturalists mostly call this substance Caochouch:

M. Bomare describes it under the name of Resin elastique. The memoires de l'Academie des Sciences, 1751, contain a description of it by M. de la Condamine, and two papers on the manner of softening and dissolving it, by M. Macquer, and Herissant, 1763; also some observations by M. Macquer, 1768, on the caochouch discovered in Cayenne; and in the same publication for 1769, there are remarks by the Chevalier Turgot on the elastic resin found in the Isle of France. The trees, vines, and plants, of different climates, producing it, are numerous, and of various sorts.

The vegetable substance of *caoutchouc or elastic gum*, as produced from the tree or vine in its native climate, cannot be imported in its original fluid state, on account of a spontaneous fermentation which would take place, and ultimately render it useless. It is technically called Indian rubber, lead eater, &c. from its being an Indian production, and chiefly used for the purpose of erasing the strokes of black-lead pencils, an inherent property for which it appears exclusively to possess. It is the indurated juice or sap of a tree; and is extracted from incisions made in the bark or otherwise by cutting off whole branches. The fluid, when first exuded, is of a white colour, and of a glutinous consistency, soon acquiring a firm texture by exposure to the air; after which its colour gradually changes to a dark brown or black, which penetrates more or less deep beneath the surface, according to its age and thickness. It is pliable, extensible, and elastic to a remarkable degree; being capable of great extension in any direction, and afterwards of regaining nearly its former size and shape, on the extending force being withdrawn. A great degree of cold renders it stiff and rigid. A moderate warmth restores its original elasticity, renders it more pliable, and increases its capability of extension. A violent heat destroys it by melting; producing at the same time a dense smoke. If the heat be increased beyond this, ignition takes place, when it burns slowly with a bright flame; and on this account it has been used for torches.

All its qualities are permanent excepting its white colour, and its original vegetable odour, which much resembles that of Chinese or Indian ink. Its specific gravity is rather less

than that of water. It is, in its *original fluid state*, capable of being moulded or formed into *any requisite shape*, impervious to air and water; and it appears to be indestructible excepting by fire, and by its known solvents of nitric ether, essential oil of turpentine, &c. Water, or the generality of oils, will not dissolve it unless at a very high temperature.

When reduced to a fluid, either by melting or by solution, it is not easily restored to a solid form, and most of its original properties are lost; excepting when nitric ether is employed, which completely dissolves it at the common temperature of the atmosphere: and if the solution be afterwards spread on the surface of paper or clay, &c. and exposed to the air, the ether soon evaporates, leaving the caoutchouc unaltered in its properties. This solution is transparent, of an amber colour; and, on being thrown into water, rises to the surface, forming a solid membrane, possessing the great elasticity and the other qualities of original caoutchouc: but, as the ether requires much expensive preparation, with longer time than the other solvents, this method for most purposes is not eligible. Essential oil of turpentine is a solvent for it, with the application of a small degree of heat. If the caoutchouc bottles are cut into small pieces, and those pieces are examined a few hours after their immersion into this solvent, they will be found to be considerably augmented in their size by absorbing the turpentine; and rendered so transparent, that all the different layers, strata, or coatings of which the bottles, and other artificial figures of elastic gum are constructed, may easily be seen through the edges of the flat pieces: this solution may be completed in about four days, by repeatedly straining it by force through cloth or hair bags. If pieces of paper or of silk or cotton-cloth, previously saturated with linseed oil and dried, be immersed in this solution, and afterwards exposed to the air, the turpentine evaporates, leaving the oil-case completely covered with the caoutchouc, possessing a remarkable degree of adhesiveness and tenacity; so that if two or more such pieces be laid over each other, and pressed together to expel the air between them, they will unite with great firmness; and, if afterwards torn asunder, they will appear to have been held in contact by numerous strings or fibres of the elastic gum on

their surfaces. Several pieces of silk, cotton, or paper oil-case, may thus be joined together to any size and shape; forming a resemblance to paste-board, flexible, and impervious to air. Compositions, for careening the balloons of aerostation, are made of elastic gum, digested in essential oil of turpentine, and afterwards dissolved by boiling it in drying linseed oil, in various proportions. A piece of indurated caoutchouc possesses an inherent toughness, resisting the edge of any sharp instrument; but if required to be cut, it may be done in any direction by making it rather warm, to increase its flexibility sufficiently to bend it over the edge of a table, and applying the sharp point of a knife to its strained surface.

The trees or vines producing caoutchouc, are numerous, and not confined to one species; but they are chiefly of the genus EUPHORBIA, *3d section*, *11th class*, *Linnæus*. Those which are found in Bengal, particularly near the mouths of the Ganges, mostly resemble the English ivy, bearing leaves at the extremities of the small branches only. The largest stems are from four to six inches in diameter, proceeding in numerous ramifications on the ground, until they meet with other support; when they ascend, and frequently bind several trees together in the numerous folds of their branches: these growing over them descend, and again take root in the ground, from whence other ramifications of stems proceed in the same manner as before. This property of taking root in numerous places is common to many English trees and plants, when suffered to grow naturally and without mutilation.

The common method of extracting the gum from the caoutchouc trees, is either by incision or by cutting off whole branches. The first method is usually preferred, and is the most easily performed; being nothing more than cutting several deep gashes through the bark, and placing shells round the tree in any convenient manner to receive the gum. The second method is injurious to the trees, but produces the greatest quantity; being sometimes more than one third of the whole weight of the amputated branches or stems: these are cut into convenient lengths, and set standing on their ends in the receiving vessels, until a sufficient quantity is collected from them. To form the caoutchouc bottles which are com-

monly imported, a ball of clay is fixed on the extremity of a stick, and repeatedly dipped into the extracted fluid. Each coating requires a short time to dry and harden, by exposure to the air or to the sun; and several such coatings produce the requisite thickness; after which the stick is withdrawn, and the clay is broken and washed out: others are formed wholly on clay. On opening some of these bottles, the remains of clay, and also the shape of the stick, may be observed in them. Their general size is from two to eight inches in diameter; their outside surfaces are either left plain, or indented, before they are perfectly indurated, with various figures, which afterwards remain indelible. They are also equally capable of receiving any kind of raised or embossed work, by the addition of small pieces of the gum to their surfaces, whilst in the same state. These bottles and all hollow figures of animals, fruit, &c. are thus molded or formed on models of clay, excepting the smaller parts of them, which are made by coating short pieces of twine or other substances with the fluid gum, and adding them to the figure before its surface is perfectly indurated.

The thick blocks of caoutchouc are made in moulds of clay; and sometimes merely by digging trenches or holes in the ground near the trees, and causing the extracted gum to flow into them, wherein it gradually indurates: and commonly so little care is taken during the process, that pieces of clay, with dry sticks, grass, and leaves, are sometimes found in the midst of their substance; and also small cavities partly filled with the juice in a fermented state; others are nearly free from these imperfections. They are generally from one to three feet long; and about two inches thick; having much of the appearance of cork. For the purpose of erasing the strokes of black-lead pencils or crayons, small pieces of these blocks are preferable to the bottles or to any other shape, being more durable and convenient. A new block on being cut appears white internally, and the more so toward the centre; but this original white colour will not remain on its surface, where it is in immediate contact with the air, longer than a few days; yet, after the dark shade has penetrated about an eighth of an inch deep, it requires a much longer time to penetrate farther.

Of the Syringe tree, Siphonia cahuchu, or Siphonia elastica, an account is obtained from the observations of M. de la Borde; who, when travelling by the order of the French government through the interior of Africa, A. D. 1772, found several of them growing on the banks of the lakes and rivers. Those in the woods are not readily observed, from their tufted branches being much intermixed with the surrounding foliage; but they may be distinguished by the number of young plants produced by their falling seeds, and springing up beneath them: these, being overshadowed by the forests, are mostly prevented from growing to maturity. The resinous juice flows at all times of the year; but the rainy season is the most favourable for collecting it; and the natives generally prefer this time for the purpose. They begin the operation by washing the stem of the tree to the height of seven or eight feet, to free it from moss, &c. and perhaps to make the gum flow more readily. A cord is then bound round the trunk at the height of about one foot from the ground, to support a trench or gutter, which is made of clay with a short spout projecting off at one side of it; under which is placed a calabash shell, or a hollow shaped piece of clay, to receive the gum. Several deep gashes are then cut through the bark, to the height of five or six feet; and the white juice exuding therefrom, flows around the trench, and runs down from the spout to the receiving vessel; into which the clay-models, of any requisite shape, are afterwards dipped repeatedly, until their surfaces have acquired by induration a sufficient thickness, or number of coatings. After the process is finished, the substance remains extremely flexible, and nearly insoluble: warm water, or a moderate heat, softens it, and makes it more pliable, but never renders it capable of being remoulded.

The Syringe tree is also a native of South America: in Brazil it grows to the height of fifty or sixty feet; generally straight and free from branches, excepting at the top, where they are numerous and much divided; its leaves are green on the superior surface, and white beneath, growing three together on the same leaf stalk; the seeds are contained in pods, each consisting of three cells, resembling those of the *Ricinus* or *Palma Christi*. Amongst others, M. Aublet has noticed its

fruit, and the white and resinous juice produced from its trunk; and a botanical description of its flowers has been given by M. Richard, a French botanist. In the forests to the north of Quito, where it is found in great abundance, the inhabitants have given it the name of *Heve*. From incisions purposely made in the bark, there exudes a white fluid resembling milk, which gradually hardens in the air: of this they make torches or flambeaux; and in the province of Quito, they render a kind of coarse cloth water proof, by covering it with a thin coat of the fluid caoutchouc, which soon indurates thereon; and it thus answers the common purposes of oil-case. On the banks of the Amazon river, the natives form the gum into rude figures of birds, fruit, and toys of different kinds, which are not easily broken. For making them they employ clay models: these are covered with one layer or coating of the gum, and exposed to the smoke of a fire until its white colour changes to a deep yellow: the same operation is repeated until it is brought to a proper thickness. When that is done, and it is become sufficiently indurated, the models are crushed by pressing together the sides of the hollow figure, and afterwards washed out. In this manner they form elastic bottles, and also shoes and boots, which in texture and colour much resemble those made of leather, and they possess the additional advantage of being impervious to water.

The nation of Omaguas, situated in the interior of South America, also form the caoutchouc into bottles, to the necks of which they fasten a hollow reed, and thus convert them into a sort of syringe. From this circumstance the Portuguese of the colony of Para, have called the tree *Pao de Xiringa;* and hence the name of *Seringat* has been given to it, and also to its resinous production. The wood of this tree has been wrought into small masts, it being both light and straight. There are other trees in South America producing a white juice, which may be converted into similar articles with those made from the common caoutchouc or syringe tree; although the quantity of juice, produced from them, and also its quality, may be various. *M. Fresneau* observes, that the elastic gum produced in the colony of Cayenne, indurates very quickly after it exudes from the tree, so that it can be formed into the

requisite shapes only at the places where it is produced; that it is applied to a great variety of uses, and is applicable to many more; and therefore may become of considerable value to the colony by converting it into regularly saleable articles.

From the preceding abstracts, it is clearly evinced that the substance of *caoutchouc is elastic, flexible, impervious to air and water*, and of a fibrous texture, not easily separated or destroyed; yet, in *its natural fluid state*, capable of being spread on cloth, paper, cordage, &c. or of being moulded or modelled on clay or wax *into any requisite shape;* and is easily obtained in the most *abundant quantities* in the various places from whence it is commonly imported.

These qualities and circumstances combined, and thus practically obtained, *are all that are required in the proposed method of constructing elastic Beds and Pillows, Portable Tent-beds, Seamen's Hammocks, water-proof Life-preservers, &c.* comprising *flexible and impermeable cases*, occasionally enclosed in external cases of the usual construction and appearance, and capable of being filled with atmospheric air, instead of down or feathers, for the purpose of being rendered more or less elastic; and also for obtaining an equal and natural temperature, and other obvious advantages of lightness and portability, buoyancy, &c. resulting from the foregoing method of construction. From the preceding abstracts it is also apparently evinced, that such a manufactory can be established with advantage *only at the places where the fluid caoutchouc is produced immediately from the trees*, unless some eligible method can be found either *to import it in this natural fluid state*, or otherwise *to dissolve the indurated caoutchouc* without destroying its essential qualities.

In addition to the present purpose, the *impermeable cere-cloth*, which has been made of various materials coated with this vegetable substance, may be advantageously applied to the numerous purposes of *leather* and of flexible *oil-case*. It may be made of any size and shape, without seams of thread, and either elastic or not, according to the nature of the cloth or other material which is made the basis of the work. It may be employed for covering chests, trunks, portmanteaus, &c. and more particularly the roofs of coaches. A thicker and

stronger sort may be made into thongs, straps, and traces, carriage harness, saddles, reins, and bridles: these would have the usual appearance of leather, and possess all the utility of it, with the advantage of the more durable properties of caoutchouc, either with or without its elasticity, as may be required; and they may be made entire, without seams of thread in any part: for, if two or more pieces of indurated caoutchouc, which are required to be brought in contact with each other, are pressed together, having some of the same substance *in its natural fluid state* previously applied to their surfaces, they will soon become equally inseparable with any other part of the work, as the fluid readily indurates between them; and, by means of additional external coatings, every appearance of the line of contact may be effectually closed. This is exemplified in the construction of some of the artificial figures of caoutchouc which are commonly imported. And, by the same means, combined with those before mentioned, various instruments, either wholly or in part, may also be constructed, particularly for hydrostatic and hydraulic purposes: as flexible tubes, of various diameters, for conveying air or water; the flexible parts of bellows of every description; some kinds of chemical and surgical instruments. Also water-proof shoes and boots; aprons and entire dresses for workmen employed in chemical laboratories, &c. And hereby considerable improvement may be made in the construction of *valves* and *concave packings*, for the pistons of hydraulic presses, forcing pumps, and condensers; also in the construction of machines of aërostation; for the entire coating of which, with all their appendages, caoutchouc may be advantageously employed, from its superior strength in proportion to its weight, and from its durable, impermeable, and elastic properties. Different sorts of twines and ropes have been coated with it to various degrees of thickness, whereby they have been strengthened, and rendered considerably more durable; and therefore ships' cordage may be more permanently preserved from decay, if thus coated with a firm, dry, flexible, and impermeable substance, than by means of any of the resinous productions which are commonly employed. And, on further investigation, it will be evinced that *caoutchouc, in its natural fluid state*, is not only

advantageous in its application in these examples, and in others which may occur, but also, that in *some instances*, it is the only substance which can be obtained *possessing all the qualities requisite for the purpose.*

J. CLARK.

Bridgewater, Dec. 4, 1815.

On Vaccination in Hindostan.

[From Forbes's Oriental Memoirs, Vol. III.]

The English have introduced the blessings of vaccination among all descriptions of people in Hindostan; by which means the lives of thousands, and tens of thousands, are annually preserved. In this humane undertaking, the Brahmins have risen superior to prejudice, and, under their extensive and powerful influence, all other casts of Hindoos have adopted the practice. Many letters on this subject from eminent Brahmins to medical gentlemen in India, do them honour; they contain the most liberal sentiments, and have been followed by a corresponding practice. *Mooperal Streenivasachary*, a Brahmin, thus writes to Dr. Anderson, at Madras, on vaccine inoculation:

"I beg leave to observe, for the information of the natives of this country, that I have perused the papers which you have published on that wonderful, healthful, and immortal vaccine matter, discovered on the nipple and udders of some cows in England, by that illustrious physician Dr. Jenner; whereby the loathsome, painful and fatal Small-pox has been prevented from seizing the many of our fellow creatures in India, as well as in Europe.

"I am an eye-witness, as well as many others, that numbers of children here have been inoculated with vaccine matter, without any injury or blemish whatsoever, excepting a small spot at the place where the matter is applied, which is commonly on the arm. It is therefore greatly to be wished that an intimate knowledge of this wonderful discovery may be acquired by the natives of this country, so as to enable them to preserve the lives of the rich and honourable, as well as those

of low casts. On this account it might be useful to remove a prejudice in the minds of the people, arising from the term cow-pock, being literally translated *Comary*, in the advertisement which has been published in our Tamul tongue; whereas there can be no doubt that it is a drop of nectar from the exuberant udders of the cows in England, and no way similar to the humour discharged from the tongue and feet of diseased cattle in this country.

(Signed) MOOPERAL STREENIVASACHARY."

As vaccination is now so generally adopted in Hindostan, and likely to become an universal blessing in that populous part of the globe, it may be satisfactory to mention the following singular fact, respecting the antiquity of vaccination in India, taken from the Asiatic Register for 1804; which is altogether a curious and authentic addition to a subject so interesting to humanity.

" The fact stated in the following translation of a written memorandum from the Nabob Mirza Mehady Ali Khan, who was long resident at Benares, that the effects of vaccination have been known for a great length of time in that celebrated quarter of India, is referred to the investigation of those who have the opportunity and ability, since they cannot want the inclination, to prosecute so interesting an inquiry. The undoubted intimation of this fact, that vaccination has been practised among the worshippers of Bowannee, will not detract an iota from the merits of the Jennerian discovery; the fortuitous and happy circumstance that led to the discovery in Europe, has been unquestionably and most satisfactorily proved, whilst the anxiety, study, perseverance, and indefatigable exertions, which have been applied by its benevolent professor to ensure the conviction of the world, in the unbounded benefit of the discovery, have entitled him to the lasting gratitude of mankind. The full ascertainment of the fact will only go to afford an additional instance of primeval oriental knowledge; whether acquired or accidental is to be hereafter proved. It will only open an additional, neglected mine, for the curious and the learned; and will be another proof that the East has been the seat of wisdom, " where learning flourished and the arts are

prized;" however much the neglect with which this knowledge has been treated in this country, may reflect upon the modern degeneracy, or the prejudices of the Indian character; which may, however, be all accounted for from the effects of the various revolutions to which their country has, for so many ages, been a prey; leaving thence room to the liberal construction of the unbiassed of every nation to conclude, that before the introduction of a foreign sway into Hindostan and the Deecan, its Hindoo inhabitants were versed in the arts and sciences, far beyond the other parts of the world, at the same remote period of time."

Translation of a written Memorandum from the Nabob Mirza Mehady Ali Kahn.

"During the period of my abode in the district of Benares, my eldest son being taken ill of a bad kind of the small-pox, and my friends interesting themselves for my comfort and his relief, one of them named Slookum Chund, a Hindoo, pointed out to me that there was in the city of Benares one Alep Choby, a Brahmin from Oude, whose practice was chiefly confined to this malady. Him, therefore, I lost no time in sending for to the town of Ghazeepoor, where I dwelt; and he arrived on the ninth day of the eruption; on seeing which he observed, that if the eruption had not taken place, he would have endeavoured to facilitate and render it easy, but that now it was too late. On asking Choby what the process was, he said, 'from the matter of the pustule on the cow, I keep a thread drenched, which enables me, at pleasure, to cause an easy eruption on any child; adoring at the same time Bowannee, (who is otherwise called Debee, Mata, and Sebla, and who has the direction of this malady,) as well in my own person, as by causing the father of the child to perform the like ceremonies; after which I run the drenched string into a needle, and drawing it through between the skin and flesh of the child's upper arm, leave it there, performing the same operation in both arms, which always ensures an easy eruption; on the first appearance of which the child's father or guardian renews his worship to Bowannee; and as the animal this goddess rides on is an ass, it is customary for such parent or guardian to fill his lap with grain,

which an ass is sent to eat up These observances ensure the propitious direction of Bowannee, so that only a very few pustules make their appearance, nor does any one die under this process.' Thus far did I learn from Alep Choby.

"Upon referring on this subject to a native, well versed in the learning and customs of the Hindoos, he told me that the practice thus described by Choby was not general among them, but confined to those who were attached to the worship of Bowannee, and adored her with implicit faith; and upon my asking the person whether he was aware how the matter of the pustule got from the cow, and whether all cows had such pustules, or only those of a certain description; he answered, that on these points he possessed no information, but had certainly understood that the cows had these pustules break out on them, and that from the matter thereof children were infected, acknowledging however that he spoke not this from ocular knowledge, but from report."

Account of a new Blow-pipe, in a Letter from Mr. JOHN NEWMAN *to the Editor.*

[From the London Journal of Science and the Arts, No. I, 1816.]

SIR,

As I conceive you must feel interested by every thing connected with science, I take the liberty of sending you a short description of an instrument calculated to lessen the fatigue attending some of the researches of an experimental philosopher. The common blow-pipe is an instrument, which, though of great value to the operative chemist, has many defects. Whilst in use it confines the motions of the person working with it, and renders him incapable of giving that minute attention to his experiment which is often required, and its application is confined, since by means of it the breath only can be employed to produce the required effect.

To obviate these and other disadvantages has been the object of many persons, and by adapting apparatus to the simple instrument, they have endeavoured to make it more complete

and perfect. Some of these improvements are calculated to leave the operator unengaged with the immediate care of the instrument, and others enable him to feed the flame with such gazeous matter as will increase the combustion and exalt the temperature; but they have in general, I think, either rendered the instrument more bulky, and consequently inconvenient; or more intricate and subject to derangement. I have long thought the blow-pipe capable of much improvement, but it was an object also to preserve its simplicity; I flatter myself, that without lessening the latter, I have added something to the perfection of the instrument.

Having frequent occasion to condense the air in cavities, I had observed with some surprise the length of time required by the air so confined to escape through such small apertures as might exist, or were purposely made into these cavities; and in conversation with Mr. Brooks he suggested, that if the stream were tolerably equable, the principle which gave rise to such an effect might be followed with advantage in the construction of a blow-pipe, and I have since verified this idea.

The instrument I have made consists of a strong plate copper box perfectly air tight, three inches in width and height, and four in length, a condensing syringe to force air into the box, and a stop cock and jet at one end of it to regulate the stream thrown out. The piston-rod of the condenser works through collars of leather in the cap, which has an aperture in the side and a screw connected with a stop-cock, which may again communicate with a jar, bladder, or gazometer containing oxygen, hydrogen, or other gasses. This communication being made, and the condenser being worked, any air that is required may be thrown into the box and propelled through the jet on the flame.

The use of the instrument is very simple. By a few strokes of the piston the air is thrown into the chamber and forms a compressed atmosphere within it. When the cock is opened the air expanding issues out with great force in a small but rapid stream, which, when directed on the flame of a lamp, acts as the jet from a common blow-pipe, but with more precision and regularity. The force of the stream of air is easily adjusted by opening more or less the small stop-cock, and I have

found that with a moderate charge it will remain uniform for twenty minutes; opening the stop-cock, or the use of the syringe, will immediately raise it to its first strength.

These blow-pipes are very portable, not liable to injury, and answer, I believe, the expectations of all who have tried them, and I have made many of them for different persons. The whole instrument, with a lamp adapted to it, packs up in a small box not more than six inches in length and four inches in width and height, and there is enough space left for other small articles. I have fitted up boxes rather larger in size with a selection of tests and other useful articles in addition to the blow-pipe, and in this state they form complete mineralogical travelling cabinets.

I am, Sir,

Your obedient humble servant,

JOHN NEWMAN.

Philosophical Instrument Maker,

No. 7, Lisle-street, Leicester-square.

Specimen of a new Nomenclature for Meteorological Science; by THOS. FORSTER, F. L. S. Hill. Soc. Nat. Sci. Phil. &c.

[From the Gentleman's Magazine, for February, 1816.]

THE habit of the English writers of borrowing from other tongues the greatest part of their technical words, especially those which are used for the sciences, is one of the causes why natural history is not so much known to the generality of the people here, as it seems to be in many of the northern countries. This fact was brought into view to me, when I asked several artists, who were about to travel over Wales and other mountainous lands, to watch for and to sketch the changes of the different forms of the clouds which took place in such places, in order to compare them with those which are common in flat countries. They told me that they could never remember the technical terms, which were made up of Latin or Greek words, which they did not understand; and wished that

names could be given to meteorological phenomena, which are formed out of our own tongue. Struck by this remark, I made the following name-list, which I shall go on with hereafter for other appearances. Meanwhile, those who will do me the favour to make remarks, or to take sketches of the clouds, &c. can make use of the following terms:

CURL-CLOUD. The old name in Latin by Mr. Howard, is Cirrus, a curl; Cirrulus and curl being the diminutive.

STACKEN-CLOUD, or Cumulus, from the verb to stack, to heap up.

FALL-CLOUD, or Stratus; being the falling, or subsidence of watery particles in the evening.

SONDER-CLOUD, or Cirrocumulus, is a sundered cloud, made up of separated orbs. The characteristic of this cloud being the gathering together into a bed, of little clouds, yet so far asunder as not to touch.

WANE-CLOUD, or Cirrostratus; from the waning or subsiding state of this cloud in all its forms.

TWAIN-CLOUD, or Cumulostratus; made often by the twining or uniting of two clouds together.

RAIN-CLO D,or Nimbus, speaks for itself. So we can have *Storm-cloud*, *Thunder-cloud*, &c.

MOON-RING, or Halo; a ring including an area around the Moon.

SUN-RING, the same about the Sun, Solar Halo.

MOON-BURR, a fleecy or confused burr about the Moon. The old name is Corona. So we have *Sun-burr*, *Double Moon-ring*, *Threefold Moon-ring*, *coloured Sun-ring*, &c.

MOCK-SUN, or *Parhelion.*

MOCK-MOON, or *Paraselene.*

MOON-CROWN: this may answer to the Halo Discoides of my Nomenclature.

RAINBOW, retains its old name instead of Iris.

RAIN-RAY, the Rabdi divergenses of my Name-list.

CONE-RAY, the Rabdus pyramidalis of the same.

SHOOT-FLAME, or shooting, or falling star, instead of meteor. Thus we can have White-tailed, Shoot-flame, &c. instead of Caudate Meteor.

WISP-FLAME, or Ignis fatuus.

POLE-STREAMER, or Northern-light. The Aurora being Australis, as well as Borealis.

BLOOMEN-FLAME, the electric flame seen about flowers, particularly the evening primrose, described in my Res. Atm. Phæn. &c.

As I intend to publish a more complete Nomenclature for Meteorological Science in the course of a short time, I have merely made this specimen, intended to be inserted in some of the periodical journals.

For explanation of the phenomena for those who are unacquainted with them, I refer to my "Researches about Atmospheric Phenomena;" in which I have given plates explanatory of the clouds, in many of their various forms. Any information on meteorological subjects with which my friends will honour me, will be thankfully received, as I am collecting materials for future publication.

T. FORSTER.

On Contractions after Burns or Extensive Ulcerations. By HENRY EARLE, ESQ. *Surgeon to the Foundling Hospital.*

[From the London Medico-Chirurgical Transactions, Vol. V.]

THE occurrence of contractions after large ulcerations where the subcutaneous tissue has been extensively destroyed, is so frequent a subject of regret among surgeons, and so constant a source of blame among the parents and friends of the unfortunate sufferers, that I trust no apology is necessary in offering the following observations and case.

I should have hesitated in giving publicity to an insulated fact, and should have waited until subsequent experience had confirmed the plan of treatment which I shall recommend to be adopted in these cases, but that I conceive the principle on which it is grounded to be perfectly established, though the present application of it may be in some respects new; and farther I am unwilling to withhold any suggestions which may at all interest the cause of humanity.

I have said that these contractions are a source of blame to surgeons; in some instances, perhaps, such reproaches are merited, as much may be done to prevent them by proper and strict attention to position during the progress of the healing process: and many limbs are suffered to continue in a bent position, by which the sides of the wound are proximated, and a smaller surface left for cicatrization, even when such wounds are in the immediate vicinity of a joint. By such practice the permanent benefit is often sacrificed to remove a temporary evil. The wounds are certainly sooner healed over, but the limb may for ever after remain contracted and useless. Frequently, however, such contractions do not depend on any inattention on the part of the surgeon, but are the result of a natural process which follows cicatrization, and which has often baffled all the efforts of art to control. This process consists in an absorption of the granulations on which the new skin has been formed; by which the cicatrix is made to occupy a much smaller extent than the originally ulcerated surface. Perhaps it would be speaking more correctly to say, that the granulations, which are at first florid and extremely vascular, after having deposited the new skin, receive a smaller proportion of blood, become paler and diminished in bulk, and consequently occupy much less surface for the new skin. In many cases, such as amputation, where sufficient integuments have not been saved to cover the bones, this process is very salutary, as it is essential to have the smallest possible extent of new skin on a surface which is to be subject to much pressure. But when it occurs in the neighbourhood of the neck or any of the joints, it often causes the most distressing contractions and deformities. The force with which this gradual process acts is truly astonishing. I have known it draw down the chin upon the sternum, and approximate the shoulders so much as to cause a partial absorption of the clavicles, and completely alter the dimensions of the thorax.

To superficial observers, unacquainted with the nature and extent of the mischief, it would appear that the whole evil depended on the contracted integuments, by a simple division of which the limb would be instantly set at liberty.

So deceptive is this appearance that I have more than once

known men indulge this vain hope of affording relief, until a painful and ineffectual operation has convinced them of their error. In recent cases, occurring in any of the extremities, the contraction may be confined to the integuments, by dividing which, the deformity may be for a time removed; but the same cause continuing to operate will produce the same effect, and the limb will again contract after the wound is suffered to heal up. Where the contraction has been of longer duration, the muscles acquire a new sphere of action, and afford an additional and powerful opposition to the free exercise of the limb. Lastly, where it occurs about the trunk, even the bony fabric becomes moulded and adapted to particular forms by the powerful constriction exerted on it by this gradual but certain process. In such cases it is hardly necessary to add, that the most severe operations cannot afford a prospect of even temporary alleviation.

From having several times witnessed such operations, which are wholly inefficient to the end in view, I was induced to adopt a different mode of proceeding in the case which I shall now beg to relate.

William Rule, aged six years, was brought up from the nursery in November, 1813, to be admitted into the Foundling. I was requested to examine him on account of a contraction in his left arm. On inquiry, I found, that, about a twelve-month before, he had been very severely burnt, in consequence of his clothes taking fire; his neck and back had been extensively injured, but were then perfectly healed; his left arm and fore arm had suffered most; particularly on the inner and fore part, and there were then several small ulcerations which had been repeatedly healed, and again broke out from the very tense state of the integuments. From the fore part of the upper arm, to within about two inches of the wrist, a firm tense cicatrix of an almost horny consistence, extended, which kept the elbow immoveably bent to a right angle. Being fully aware of the inefficacy of a mere transverse incision, on mature consideration of the case, I proposed to remove the whole cicatrix, and to endeavour to approximate the integuments from the two sides of the arm, which was to be kept extended on a splint, not only during the healing of the wound, but for a consider-

able time after the cicatrix had formed; until, indeed, those changes, which I have above described, had been fully accomplished. By such practice I conceived that the contraction, which I knew must follow so extensive a wound, would take place in a lateral direction, and not in the long axis of the limb. In a word, I hoped to be able to direct and modify that, which it was not in my power to prevent, and thus, at all events, counteract its injurious effect. Having submitted my opinion to some professional friends, which met their concurrence, on the 12th of November I performed the operation with the assistance of Mr. Lawrence, in the following manner. I made an incision on the outer side of the cicatrix, commencing about two inches above the elbow, where it was broadest, and terminating within two inches of the wrist; nearly the whole of this incision was made through the sound integuments. I then made a similar cut on the inner side, and carried it down gradually, converging until it met the opposite incision. The upper part of this incision was necessarily made through the cicatrix, which nearly enveloped the inner side of the elbow. The next step was to dissect off the firm horny cicatrix, which I detached from below upwards as high as the commencement of the incision, conceiving that this triangular flap of cicatrix might be useful in accelerating the healing of so extensive a wound. I did not remove it from its upper broad basis, thinking that it might unite in its new situation. On attempting now to extend the arm, we found considerable resistance from the forcible contraction of the flexor muscles, which had been so long accustomed to a more limited sphere of action, that they with difficulty admitted of any extension. By degrees, however, they yielded considerably, and the arm was brought nearly to a right line. When the arm was so extended, the extreme point of the cicatrix, which still remained attached to the upper arm, was deficient nearly three inches of reaching the part from whence it had been removed.

The sides of the wound were now approximated as much as possible with adhesive plaister, and the whole limb was bound down on a splint. As the operation had been rather tedious and very painful, and there was great disposition to spasm in the biceps, I gave him a large dose of opium, and

directed the nurse to sit by him and hold his hand, which checked the violence of the cramps. This disposition in the muscles to contract gradually abated, and the following day I was able to extend the arm perfectly to a right line. On removing the dressings, four days after, I found that the whole of the cicatrix which I had detached, had sloughed; in consequence, I suppose, of its being a part of new formation, and not possessing the same vital powers with an originally formed part. The slough was soon thrown off, and the wound, though extensive, wore a healthy aspect.

Nothing sinister occurred during the progress of the cure, and the whole was perfectly healed by the 20th of December. I continued to apply the splint constantly for about six weeks longer, during which time the cicatrix diminished much in a lateral direction, and in a very slight degree in the long direction, but the arm continued perfectly straight. I now permitted him to use his arm for some hours during the day, but re-applied the splint when in school and at night. By degrees he left off the use of the splint altogether during the day, but I directed it to be applied at bed-time until about a week since. I am happy to add, that nearly five months have now elapsed since the wound was healed, and his arm continues perfectly straight, and he enjoys the free use of it as much as the other. The cicatrix has contracted laterally to about one-third the size of the wound, is quite insensible, hard and devoid of vessels, and on the whole, from its present appearance, I do not apprehend that any further alteration will take place.

I have considered this case not unworthy of attention, as it strongly illustrates the efficacy of art, well directed, in counteracting and even rendering subservient a powerful law in the animal economy. The view which I have been led to take of the subject is, I believe, new, and the result of the case will, perhaps, warrant my expectations that it may be beneficial both in the prevention and cure of many deformities and contractions in the extremities.

Should a similar case occur to me again, I should prefer the removal of the whole cicatrix at once, to leaving it with the probability of its sloughing.

Report on the Epidemic Small Pox and Chicken Pox, which prevailed in New-York during the last Autumn and Winter, explanatory of the Causes of supposed Failures of the Vaccine Disease. Ordered by the Medical Society of the City and County of New-York, at their quarterly meeting, January, 1816.

[The re-appearance of Small Pox in the City of New-York during the last year, has excited the attention of the Medical Society; the report of whose committee may be considered as a valuable document on this interesting subject. They have designated the origin of the disease, its character and mortality, and have expressed their opinion on the efficiency of Vaccination, and of the sentiments entertained with respect to its preservative power. They also give an account of the appearance of Varicella, with the unusual severity of its symptoms.

We make an abridgment of this publication, which is well worthy of public notice, and hope it may excite similar attention in other parts of our country, where epidemics shall appear in uncommon forms.]

To the Medical Society of the City and County of New-York.

The Committee appointed to examine into the progress of the Small Pox for the year past in this city: to ascertain the origin of reports which have arisen unfriendly to the Vaccine Inoculation, and to enquire into any supposed failure of the Kine Pock:

Respectfully Report:

That they have diligently endeavoured to ascertain the origin of the small pox. The first fatal case of that disease was found reported at the Inspector's Office on the 15th May, 1815. It occurred in the person of a soldier of the name of Asa Tanner, who had been for a long time in a Military Hospital on account of frosted feet, from which he had not recovered when he arrived in this city, in a coasting vessel from Boston. He lodged in a common boarding house in the lower end of Front-street, and was taken sick immediately after his arrival: it was a case of confluent small pox, which terminated his life in five days. No person was discovered to have taken the Small Pox from this man excepting another soldier and fellow-lodger in the same house, who, it is believed, died in the Military Hospital at New Utrecht, on Long-Island.

No other fatal case of this disease is found recorded until

the 28th of August. Another death occurred on the 30th of the same month, more than three months after the first recorded death by the small pox.

Your committee are informed by A. Smith, a soldier, that the small pox existed on Governor's Island in February, 1815. He particularly mentioned a girl of the name of Munson, the daughter of a soldier, who had the small pox about that time. She was attended in the hospital by the military surgeon, and recovered.

In the early part of October, the small pox appeared in various parts of the city, and further inquiry into succeeding cases of it was deemed unnecessary.

Your committee not having been able to procure any public or private records of the cases of small pox, except of those which were fatal, regret that it has not been in their power to trace more explicitly the introduction of that disease into our city.

Your committee, however, are inclined to think, that it was introduced from some distant place by means of trading or coasting vessels: this opinion is derived from the consideration of the two first recorded deaths, and of the second case of the disease; or, that it has been conveyed into the city through the military, with which our intercourse has been more extended and multiplied during the continuance of the late war, than any other district of the union. The early appearance of the small pox in the military hospital of Governor's Island, and the fatal termination of the complaint in three soldiers at the commencement of the epidemic, have already been mentioned.

In the course of the month of November, the United States' frigate Guerriere arrived in this port from the Mediterranean, with many of the crew labouring under the small pox; seventeen cases of that disease were carried to the hospital at the Wallabout.

Your committee have to offer a few remarks in relation to the character and mortality of the small pox, as it has appeared in our city. As an epidemic, generally speaking, it has been so virulent in its nature, as to attack almost every individual in whom the susceptibility to its action had not been destroyed

by inoculation or vaccination. The duration of the disease was generally short, the progress of it very rapid, and the treatment, comparatively speaking, but rarely successful. In the the majority of instances it was confluent: adults appear to have been as subject to it as children. It prevailed most among the poorer classes of the community, and more in the eastern and upper parts of the city, than near the North River, and in the larger streets on the west side of Broadway. The proportion of deaths, from this confluent small pox, has been greater, in the opinion of your committee, than has ever been observed in London, or on the continent of Europe. The number of deaths, recorded in the Inspector's Office, amounts to two hundred and fifty-four; and thirty-nine deaths are reported to have occurred at the Lazaretto. This number, in the opinion of your committee, is somewhat more than one third of the aggregate cases of the confluent small pox that have occurred in the city. But supposing the aggregate of such cases of the small pox to be only eight hundred; and admitting an addition of one third of this number to have taken the small pox in a mild way, or of the distinct kind, it will give a total of nearly eleven hundred cases of the small pox that have occurred in this city and its suburbs, from the period of the first reported death, to the 1st of April, instant; exclusive of a very large proportion of persons that have received the disease by inoculation, and of whom no precise or definite estimate can be made, for the want of the necessary records.

The varicella, or chicken pox, another eruptive and febrile disease, appeared about the same time with the small pox, and prevailed generally throughout the city and its suburbs. It was marked by severe and unusual symptoms, and presented the appearances in particular cases, that have been said to belong to swine pox, or water pox, authorising the conclusion of their being varieties of the same disease.*

It has been observed, that "medical assistance being seldom necessary in the chicken pox, practitioners are less acquainted with this than most other eruptive fevers."† The committee here advert to the opinion of such high authority on this sub-

* Thomas's Modern Practice. † Wilson on Febrile Diseases.

ject, for the purpose of explaining the instances of chicken pox, that have been mistaken for the small pox; and also to account for the differences in the histories of this disease, as furnished by European writers; and who have not described it agreeably to the appearances and severity it has exhibited during the late epidemic. The committee agree with the European writers in the opinion, that no danger ever attends the chicken pox; that its pustules form much sooner; are irregular in their shape, more transparent, and seldom contain well-formed pus. They agree also, that by the fifth day they are generally drying or disappearing; and that from this period all the symptoms continue to decline, leaving no marks on the skin, excepting in a few instances, or from accident.

Authors have generally remarked, that this disease arises from a specific poison; but it should also have been added, that this poison must necessarily be ephemeral and extremely mild in comparison with small pox, since it is admitted that danger never attends the former; that its largest pustules disappear without the least injury to the system; while the epidemic small pox is generally followed by a secondary fever as a part of a much more protracted disease, the violence of which is in proportion, it is supposed, to the quantity of matter absorbed, and oftentimes places the life of the patient in the most imminent danger.—It may also be noticed, that the vesicles of the chicken pox present large and irregular, or only partial scabs, situated on their apices, and do not leave the discoloration of the skin, which frequently continues a very long time after the small pox; that, at the period of desquamation, there are very perceptible prominences in the skin, very easy to distinguish from the even or indented surface left by the small pox; the pustules of which are converted into scabs, or their contents are discharged on the skin.

Authors have stated, that varicella is preceded by a short slight fever, or by a fever of uncertain duration, and that it is not attended by severe symptoms. Your committee, however, have seen it assuming a degree of violence equal to some of the forms of small pox, producing convulsions and great general derangement of the system. They have remarked also what they find to have been noticed by Pinel, Willan, and

others, that the chicken pox may be confluent to a great degree; and they believe that it may be protracted to a longer period even than small pox, owing to the partial eruption of pustules, and the successive formation of others for many weeks; that the eruption may be more abundant on the face and head, than on the back and breast, and that it may even occasion a swelling of the face.

It has been further represented, that the chicken pox depends upon a specific contagion; that it affects a person but once in his life, has a great resemblance to the small pox, and is communicable by inoculation with the lymph of the vesicles.*

Whether the aggravated form of chicken pox that has been observed during the last autumn and winter was owing to any peculiar atmospheric constitution, or other cause, and whether it is to be considered a special variety of chicken pox, to be added to the form most commonly described, your committee will not venture to decide. They can however affirm from observation and conviction, that numerous instances of the prevailing form of this complaint, being slightly noticed, and occasionally mistaken, have contributed greatly to multiply reports of the failure of vaccination. They have been repeatedly called to witness *such instances* of the failure of vaccination, and of pretended or imaginary cases of the small pox, which would be erased much sooner from the skin, than erroneous impressions could be removed from the minds of the uninformed and inexperienced.

From the foregoing statement of the origin and progress of the late epidemic, and of the causes of reports unfriendly to the vaccine disease, your committee may be allowed to suggest, that more effectual means should be devised to guard against any future occurrence of the small pox; to promote a more general adoption of the practice of kine pock inoculation among the poorer classes of the community, and to introduce such improvements as are best calculated to obviate the evils that may arise from the failure of vaccination hereafter.

* Bateman on cutaneous diseases.

Note. The eruption of varicella is sometimes preceded by a general rash on the skin, similar to what is observed in small pox.

On all these important topics, the committee have to offer what they believe to be conclusive and practical remarks: they would premise, however, some observations respecting the "improved mode' of vaccinating lately proposed by the London Vaccine Institution. It appears that 'the board'* attributes many failures to vaccinating by a single puncture, and afterwards opening the vesicle, and taking a portion of the lymph for the purpose of propagating the infection. Should the doctrine thus officially promulgated by that institution be true, your committee must necessarily infer, and deeply lament, that vast numbers of persons in this and in other countries, remain only delusively protected by vaccination, since the practice thus reprobated has been very generally approved, and has as generally prevailed throughout Europe and America.

The "board of the London Vaccine Institution" have not been at the pains to state the period of the disease at which the puncture or rupture of the vesicle may interfere with its operation on the system; but inasmuch as the effect of the disease generally takes place on the seventh or eighth day, it may be inferred, that the board apprehended that danger may arise from puncturing the vesicle at any time during the existence of lymph in it. With all deference and respect to such high authority, your committee owe it to themselves, to the Medical Society of which they are members, to the laws of the animal economy, to the laws of contagion in general, which they consult, and to the tranquillity of the public mind, which they wish to establish,—explicitly to declare their dissent from the doctrine promulgated by that board, and which is founded upon the principle, that by diminishing the quantity of the vaccine virus, or lymph, after it is formed in the part, the operation of the disease on the system is in danger of being destroyed or enfeebled, notwithstanding the lymph is secreted in the part, and possesses all the characteristics of the vaccine virus. Admitting, for the sake of argument, that it is experimentally proved that a small pox pustule, and a kine pock vesicle, can be locally excited, and can respectively furnish genuine virus, in persons who have already had those

* Medical Repository, No. 2, vol. III. N. S. p. 201.

diseases; yet it is believed to be utterly unknown, that a true and genuine pustule of small pox, or vesicle of kine pock, can take place without infecting the system, if susceptible of either of those diseases at the time. No contagious disease, after being communicated by the inoculation of its specific virus, is known to have been arrested: this can only be done by the immediate destruction or removal of the poison, or of the part to which it has been applied, before absorption has taken place. Absorption of the inserted virus is absolutely requisite to excite its specific disease, in a person in whom the susceptibility to it exists, or has not been destroyed; and it must have had a complete evolution in the system, or have exercised its peculiar property in producing an appropriate disease, when the pustule exhibits, among other characteristics, the presence of lymph, or matter capable of reproducing the same.

If the bursting or puncturing of the vaccine vesicle could endanger or subvert the efficient operation of the disease on the system, the genuine character of the vesicle should be completely destroyed, which has not been observed in any of the numerous instances that have occurred; for, whatever injury the vesicle may have sustained, the peculiar scab, more or less expressive of the disease, is reproduced, and its peculiar mark, more or less enlarged, is left on the skin. Your committee are not acquainted with any thing that can possibly interrupt or prevent the constitutional operation of the kine pock in a susceptible subject, excepting a morbid state or action of the system, which may preclude every character of the disease, or a constitutional excitement inimical to cow pock, and giving rise to many of those irregularities "observed in the progress of the affection at the part inoculated."*

It is well known that Mr. Bryce, of Edinburgh, several years ago recommended a process as demonstrating the constitutional operation of the vaccine disease, and which consisted in performing a second vaccination about the end of the fifth, or beginning of the sixth day after the first. If a constitutional affection be produced by the first, the progress of the second vaccination is so much accelerated, that by the eighth or tenth day from the period of the first vaccination, both

* Bryce on Cow Pox.

vesicles are equally far advanced, the second vesicle being a miniature likeness of the first. Against the truth of this fact, or the conclusion which it furnishes, no possible objection can be made; it implies that additional vesicles, so far from imparting more power or energy to the virus previously inserted, are altogether under the control of the first. It is of little importance how many vesicles there may be, or at whatever time they may be excited, since one alone fully imparts the constitutional action of the disease. Experience also offers another fact to prove the inutility of additional vesicles to secure or complete the action of the disease on the system. If additional vesicles impart strength or preventive power to the process, how is it that spontaneous vesicles do not occur in the most active cases of that disease? There are various degrees of activity in diseases arising from specific contagions. Thus the vaccine sometimes excites high fever; produces an uncommonly large vesicle, attended with an unusual degree of inflammation, and secondary suppuration; but it hardly ever creates an additional vesicle; at least so very rarely, that the oldest vaccinators have not perhaps witnessed it more than once or twice. Your committee conclude, that the mode recommended by the London Vaccine Establishment, of exciting two vesicles instead of one, is never absolutely necessary; and that the utility of it can only be urged as an additional security to the introduction of the virus, by multiplying the chances of success.

A very extensive and dangerous source of error arises out of the idea of a certain *spurious* vaccine disease, and a certain *spurious* vaccine matter. It may be traced to the written and oral opinions of the earliest vaccinators, who did not discriminate between an imperfect and defective operation of the system, and a supposed specific matter, which has since been thought capable of producing a specific spurious disease. Great stress has been laid on this subject, without offering the least direct or convincing proof of the reality or existence of such an article as a spurious cow pock matter. From whence does it proceed, and where shall we search for it? Does it originate in the cow, and is it thence perpetuated by inoculating the human body, or is it spontaneously generated in man? Is it

durable, ephemeral, or variable? By what regular characters can it be detected, judged of, and described? And why, if it be a specific contagion, does it occasionally arise from the use of genuine cow pock matter? It appears somewhat remarkable, that many of these points have hitherto been only carelessly adverted to, by persons who have endeavoured to engage the sanction of the public in instituting a vaccine establishment, sounding the alarm and danger of a spurious matter, and ascribing the want of success in vaccinating to the use of it.

Having alluded to the deficiency of proof respecting the existence of a specific spurious vaccine virus, your committee would not be at a loss to substitute opinions and inferences on this subject, apparently more consistent with facts and practical observation, to account for the irregularities or deviations, which have been construed into marks of a spurious disease. They however do not think it proper, at present, to enter into the consideration of that subject, but leave it for a future and more particular investigation.

Professional men should feel it indispensably necessary to conduct the process of vaccination with the greatest possible attention, through all its stages, and until its complete operation on the system has taken place; and they should ever be ready to repeat the process, if any irregularity or deficiency in the first shall have been noticed.

It may be suggested, for the proper discharge of this important duty, left entirely to the responsibility of the physician, that a regular period of attendance should be observed throughout the whole course of the disease; that attention should be especially given on the fifth, seventh, ninth, and twelfth days, or at least three times during the first ten or twelve days of the disease; and lastly, that the unerring test, proposed by Mr. Bryce, should be resorted to whenever it is practicable. The importance of attending to persons who have been vaccinated, is the more sensibly felt by your committee, because in the many instances of suspected or reported failure of vaccination, they have scarcely been enabled to collect any satisfactory medical testimony in relation to the nature and progress of the previous disease.

Your committee have been at great pains to examine into the

history of some of the cases in which small pox is said to have succeeded to the kine pock. They are compelled to state, that in several instances, no other evidence of vaccination could be obtained than the oral and insufficient testimony of the patient or his friends, and that not even the least mark of a kine pock vesicle could be discovered. That in other instances, when a mark in the skin was triumphantly proclaimed as an evidence of previous vaccination, the person's arm had been treated by salves, poultices, and other applications, ordinarily resorted to for the healing of common sores; that in others, the arm had become excessively inflamed, the swelling had extended from the elbow to the shoulder, and the sore had continued to discharge profusely for many weeks; and finally, that in other instances, their attention has been directed to marks on different parts of the body, the consequence of sores, which were supposed to furnish the strongest evidence of the constitutional effect of the vaccine disease; an opinion that is fraught with danger, and is in opposition to the writings of Jenner, and the best authors on this subject, all of whom affirm, that no cutaneous eruption whatever, belongs to the kine pock disease.

Neither is the kine pock a preventive of small pox for a limited time only, nor does it produce new and dangerous diseases, as has been affirmed by its opponents. Already has it proved a security against the small pox for the space of near sixty years; persons having accidentally taken the disease from milking cows in Gloucestershire, in England; where it has been believed, time immemorial, to protect them against the small pox.

On the subject of cutaneous diseases, no authority ever stood higher than that of Dr. Willan, who has said, after the most careful examination, that no new disorders have appeared since the discovery of the kine pock; that he has investigated many cases that were attributed to the kine pock, but found diseases well known and described a thousand years ago; common diseases of the skin, having no connexion whatever with the kine pock. The number of diseases of the skin, instead of increasing, have diminished since the introduction of this preventive; in proof of which, facts were adduced by Dr. Willan and others, who also assert, that the kine pock has a decided

advantage over the small pox, measles, and scarlet fever, in not exciting any other disease.* In a report of the Royal College of Surgeons of Edinburgh, in 1807, it is said, "The members of the Royal College have met with no occurrence, in their practice, of cow pock inoculation, which could operate in their minds to its disadvantage; and they beg leave particularly to notice, that they have seen no instance of obstinate eruptions, or of new and dangerous diseases, which they could attribute to the introduction; among mankind, of this mild preventive of the small pox." And in a report of the College of Physicians of London it will be found, that "the testimonies before the College of Physicians are very decided in declaring that vaccination does less mischief to the constitution, and less frequently gives rise to other diseases than the small pox, either natural or inoculated."

To encourage the practice of vaccination among the poor classes of the community, is an indispensable precaution to avert the dreadful effects of future epidemics of the small pox. Your committee have already adverted to the prompt and humane measures taken by the common council, board of health, and city dispensary, in December last, for this purpose; but they would earnestly recommend still more efficient regulations than those which are instituted by Philanthropy, and in consequence of the immediate pressure of a public calamity.

Your committee are informed, that most of the continental nations of Europe have successfully contended against the small pox, by providing for the vaccination of the poor, and at the same time making it a penal offence to inoculate for the small pox. It is a lamentable fact, evinced by experience, that nothing short of compulsory measures is sufficient to oppose the effects of ignorance and prejudice.—To guard against the introduction of the small pox into this populous and commercial city, is an object of great moment, and well worthy attention in revising the health laws. Would it not be advisable to reconsider the propriety of excepting the disease of small pox from among those which are the objects of

* Willan on Vaccination.

quarantine laws? Ought not every vessel infected with the small pox to be interdicted from approaching this large population? And ought not every case of the small pox, occurring in our city, to be immediately reported to the board of health, to apprise the citizens of the danger of approaching it?

Previous to the discovery of the kine pock, it was computed that forty thousand persons died annually from the small pox in Great Britain and Ireland; that in twenty-five years, Europe had lost fifteen millions of inhabitants by that disease, and that in America the natural small pox had proved proportionably still more destructive. Every inoculation therefore, for the small pox, tends to destroy life, and to perpetuate that loathsome disease; whilst every vaccination tends to preserve life, and to extinguish the small pox.

In concluding this report, your committee must advert to the general testimony of the oldest and most skilful professional vaccinators, whose opinions and writings they have been able to consult, and whose discerning minds have not laboured under the acrimony of controversy, or been influenced by prejudice or misapprehension. Their testimony is found to be uniform and unequivocal in favour of the efficiency of the vaccine disease. It must, however, be stated with regret, that there are a few physicians who seem still to entertain some doubts on the subject, and who, by cherishing the popular distrust of it, have, in the opinion of your committee, hazarded their reputation and the public good; but who invariably proclaim, that the small pox is rendered extremely mild in every instance after vaccination.* If a few facts of this kind, and leading to the same conclusion, were admitted for the sake of argument, they would necessarily lose their weight, when artificially or otherwise produced during the prevalence of pustular and anomalous eruptive diseases; some of which are often observed to resemble not only the small pox, but even the itch, the measles, and scarlet fever. An analogous fact has lately occurred in this city, in the appearance of a phlegmonous disease of the glands of the throat, that was frequently mistaken for the mumps.

* A second attack of small pox, which is admitted to have happened frequently, has either proved very violent, or terminated fatally.

Some idea of the perfect efficiency of the kine pock may, in the opinion of your committee, be conveyed to the public mind, by the relation of a fact that has been recently observed. In a former part of this report, it was noticed that the small pox had appeared on board of the United States frigate Guerriere: an enquiry was instituted by the surgeon to ascertain whether any of those infected with that disease, had ever had the kine pock; not one of them had had it! It was found however that there were one hundred and seventy-one who had been vaccinated in various parts of the United States and in Europe, not a single one of whom took the small pox, though constantly exposed to it in a crowded ship.

The society for the propagation of vaccination in France, reported, that nearly four hundred thousand persons were vaccinated in the year 1801, in the French dominions. Many of them were inoculated for the small pox, and others were exposed to it during the prevalence of a severe epidemic small pox, yet all of them resisted its influence; and since that period it is stated in a report to the Imperial Institute of France, that only seven persons took the small pox, out of two millions six hundred and seventy-one thousand six hundred and sixty-two persons that were vaccinated; clearly demonstrating the advantage of the kine pock in increasing population, and the welfare of mankind. By a report from Sir Alexander Chrichton, *superintender* of vaccination throughout the Russian Empire, it appears, that during the years 1811, 12, 13, nine hundred and sixty-two thousand four hundred and three persons were vaccinated in Russia. In Spain the knowledge of vaccination was received with avidity, and was taken under the protection of the government at an early period. It would be superfluous to adduce other evidence of the kine pock as a preventive of the small pox.

Your committee beg leave to call the attention of the society to one other circumstance only: had the same number of susceptible individuals existed in this populous metropolis, as would perhaps have existed in it, had not the kine pock been discovered, we should, during the last six months, in all human probability, have had to mourn over an immense destruc-

tion of its inhabitants; the fate, alas! that has already been often deplored in many countries, and in many populous cities.

(Signed) WRIGHT POST, M. D.
WILLIAM HAMERSLEY, M. D.
JOHN NEILSON, M. D.
FELIX PASCALIS, M. D.
JOHN WATTS, JUN. M. D.

An Account of some Diseases of the Toes and Fingers, with Observations on their Treatment. By JAMES WARDROP, Esq. F. R. S. Edinb.

[From the London Medico-Chirurgical Transactions, Vol. V.]

I. *Inflammation of the soft parts surrounding the nail of the toes.*

THERE are many diseases on which medical men seem to have bestowed little consideration, from the unimportance of the parts affected, as far as regards the life of the patient, but which nevertheless sufficiently disturb the comforts and enjoyments of those who are afflicted with them, to merit investigation.

There are no diseases to which this remark may be more justly applied than to some of those of the toes; and the subsequent observations have been made in order to give an account of some of those which have not hitherto been mentioned, and of recommending a treatment in others which may be found more successful than the means which have usually been employed.

The first of these diseases which shall now be considered, is where inflammation and suppuration take place in the soft parts contiguous to the nail, generally denominated, "the growth of the nail into the flesh."

This affection is chiefly confined to the great toe. It frequently happens, when the foot is kept in a tight shoe, that the soft parts situated on the edge of the nail thicken, are pressed over it, and become more or less inflamed and painful. If the inflammation and thickening of the soft parts increase, the

edge of the nail becomes, at last, completely imbedded in them, and its sharp edge, from the pressure of the body when resting on the foot, increases the inflammation and produces suppuration of the contiguous soft parts. Thus the hard and sharp nail, by pressing on the surface which has become ulcerated, causes great pain and lameness, and in many cases prevents the person from walking. The ulceration generally extends round a considerable part of the nail, and a fungus arises from this surface, accompanied by excessive irritability.

All those authors who have taken notice of this affection have considered a peculiarity in the growth or in the formation of the nail as the cause of the disease in the soft parts. The different modes of treatment therefore which have been proposed are directed to remedy this supposed deformity of the nail.

Some direct, that the edge of the nail which presses in upon the tender soft parts should be raised by placing underneath it a piece of tin-plate, and thinning the middle part of the nail by scraping it with a piece of glass; thus allowing the nail and its edge to take a turn upwards from the soft parts, and assume a new form. Others advise the edge of the nail to be cut away, so that it shall be out of the reach of the soft parts.

An accurate examination, and above all, observing attentively the progress of the disease, from its commencement, will be sufficient to prove that the nail undergoes no alteration in its shape, and that it has no further share in the production of this troublesome complaint than affording a mechanical resistance to the tender flesh, and becoming from its proximity to it a constant source of irritation.

I was led chiefly to make this remark, from observing on the great toe of a gentleman, whose nail was perfectly well formed, a considerable tumefaction and tenderness of the soft parts on the edge of the nail; to relieve which he was in the habit of cutting the nail very short, and removing that portion of the edge which had penetrated into the soft parts. From this operation, a temporary relief had always been obtained; but when the nail began to grow again, all the former uneasiness and inconvenience returned. It being probable, that in this case, the tenderness and swelling of the soft parts arose from, and were kept up by the pressure which those parts constantly made on

the fresh-cut edge of the nail, it occurred to me, that if the nail was allowed to grow of its natural size and shape, and some means taken to reduce the swelling of the soft parts, the disease might be removed. Accordingly the nail was allowed to grow, and the swollen parts were slightly touched with lunar caustic. The beneficial effects of this treatment were soon manifest. The caustic had the effect of producing an absorption of the thickened soft parts, the nail soon recovered its natural smooth edge, and the patient has never since had any uneasiness, except when from inattention he has accidentally cut the nail too short.

Soon after I had seen this case, an example of the disease in a much more advanced stage came under my observation. The soft parts on the edge of one side of the toe-nail, which was of its natural shape, were greatly swollen—suppuration had taken place where the nail was imbedded in them, and a painful fungus had arisen; so that the person was unable to rest the weight of the body on the affected foot.

After one application of the caustic the irritable state of the ulcer was removed; and in two days the fungus and swelling of the soft parts were greatly diminished; and by a second application these completely subsided. The nail was left untouched —and in a few days the patient was enabled to walk about, and he continued afterwards perfectly well.

In a third case the good effects of this mode of treatment were strikingly illustrated. A gentleman had for several years suffered great distress from inflammation and swelling of the soft parts, at the edge of the nail of the great-toe, and had during that time on many occasions for several weeks been unable to walk. He had frequently cut away all that portion of the nail which was imbedded in the diseased soft parts, and which appeared to him to be the cause of his complaint; and though from this treatment he experienced temporary relief, yet as soon as the nail began to grow again, all the former symptoms recurred. A few days after the nail had been in this manner cut away, he applied to me, and I rubbed the tender and swollen parts over with lunar caustic; this was followed by an immediate abatement of the pain and swelling; and by afterwards allowing the nail to grow, he has never since experienced the least uneasiness.

Perhaps the most remarkable instance of the beneficial effects of this mode of treatment, was that of a woman, who for ten years had been extremely lame in both feet, and who during that period had submitted to several painful operations of cutting out portions of the nail, without any permanent relief. The nails in this case were very thick and circular, so that they were deeply imbedded in the soft parts. The swelling of these, however, was completely subdued by frequent applications of the caustic; and in addition to this treatment I removed a portion in the form of a V from the middle of the nail, a practice common amongst soldiers, and which might perhaps in some degree serve to allow the external angles of the nail to yield and be raised from the swollen soft parts.

Besides these cases, I have had several opportunities of trying this practice, and it has been invariably followed by equal success.

From what has been said, it will be observed, that the chief point to be attended to in the treatment of this disease is, not to cut away any of the nail, but to reduce the swelling of the soft parts. I have generally found that one or more applications of the lunar caustic have had the effect of entirely removing the swelling of those parts. The caustic destroys the painful and irritable ulcerated surface, whilst at the same time it promotes absorption of the thickened parts. In some cases it has been thought necessary first to alleviate the accompanying inflammatory symptoms by the application of poultices, and in some instances also, the alumen ustum has been found to answer better than the caustic; but in all the cases, these means succeeded in curing the disease.

It may here be remarked, that in order to prevent either the recurrence or the formation of a disease of this kind, care should be taken not to cut off the corner of the nails, particularly that of the great-toe; for when this is done, the shoe presses the adjacent soft parts against the sharp edge of the nail, and thus produces pain and inflammation.

II. *Of Ulceration at the Root of the Nails.*

This disease appears to be a peculiar inflammation of the soft parts at the root of the nail, and probably those connected with the formation of that organ. It may properly be consider-

ed as a species of Onychia or Panaris, and I have therefore denominated it the *Onychia Maligna*, from its very malignant character.

The commencement of this disease is marked by a degree of swelling of a deep red colour of the soft parts at the root of the nail. An oozing of a thin ichor afterwards takes place at the cleft formed between the root of the nail and soft parts, and at last the soft parts begin to ulcerate. The ulcer appears on the circular edge of the soft parts at the root of the nail, it is accompanied with a good deal of swelling, and the skin, particularly that adjacent to the ulcer, has a deep purple colour.

The appearance of the ulcer is very unhealthy, the edges being thin and acute, and its surface covered with a dull yellow or brown-coloured lymph, and attended with an ichorous and very fetid discharge. The growth of the nail is interrupted, it loses its natural colour, and at some places appears to have but little connection with the soft parts.

In this state I have seen the disease continue for several years, so that the toe or finger became a deformed bulbous mass. The pain is sometimes very acute, but the disease is more commonly indolent, and accompanied with little uneasiness. This disease affects both the toes and the fingers. I have only observed it on the great-toe, and more frequently on the thumb than any of the fingers. It occurs, too, chiefly in young people, but I have also seen adults affected with it.

The treatment of this disease has generally been considered as difficult and uncertain. In many cases all local applications have been so inefficacious that the amputation of the member has been had recourse to.

The only local treatment which I have ever seen relieve this complaint, has been the evulsion of the nail, and afterwards the occasional application of escharotics to the ulcerated surface. But even this painful operation, in some cases does not succeed, and will seldom be submitted to by the patient; he must therefore either continue lame, or submit to the removal of the member. Other surgeons have cut out the soft parts at the root of the nail, an operation equally severe.

A successful mode of treating this disease, by avoiding any of those painful resources, becomes therefore an object of im-

portance, and as I have had an opportunity of observing very beneficial effects from the internal exhibition of mercury in several cases, it may be proper here to mention them.

In two of these cases the great toe was affected, in other two the disease appeared in the fingers. In all of them it had continued a considerable time, and in one of those where the finger was affected, there was often a profuse hemorrhage from the ulcer. Mercury was given in small doses at first, and gradually increased, so as in twelve or fourteen days sensibly to affect the gums.

The sores in general soon assumed a healing appearance after the system was in this state, and the bulbous swelling of the joint gradually subsided. The ulcers were dressed with wax-ointment, so that the effects of the mercury might be watched, and after the sore began to heal, a weak solution of the muriate of mercury and escharotics were occasionally used to clean the wound or keep down any fungus. The mercury was continued till the ulcers were perfectly healed, and, as is generally advisable under such circumstances, it was taken in smaller quantities for some time after the patients were apparently cured.

How far this treatment may be found successful in all cases of this disease, can only be determined after considerable experience. I am persuaded, however, that there are cases wherein it will be found an efficacious remedy.

§ III. *Of Corns.*

The great relief which *corn-cutters* give by simply removing the thickened and hardened cuticle, must have prevented medical men from making any inquiries into the nature or particular treatment of this disease; and whilst it escaped the notice of the latter, it could not have been a desideratum of the former, that any mode of treatment should be found out which might make their operations less useful, or more seldom necessary.

If a corn be examined, it will be found to consist of an increase in the thickness of the cuticle of the affected part; which, by acquiring firmness and hardness, presses on the tender skin underneath, thus exciting pain and inflammation.

The portion of diseased cuticle is thickest at the central part of the corn, and forms a conical point, which makes a corresponding concavity in the corn underneath. The inflammation sometimes terminates in suppuration, and the distress which is thus occasionally produced, exceeds what might be supposed to arise from a disease which is at its commencement so trifling.

When all the hard parts are removed, and some slight defence giving to the newly exposed and tender parts by the application of adhesive plaster, great relief is obtained; but it is only temporary. A new growth of hard cuticle quickly succeeds, which renders it soon necessary to recur to the same means; and these must be employed more or less frequently during the remainder of life.

From the great analogy of corns to the common *wart*, a disease so successfully removed by the application of escharotics, it seemed by no means improbable that a similar practice might be efficacious in the cure of corns. Accordingly I embraced the first opportunity of putting it to the test of experience.

After removing the external layers of a corn, I rubbed the surface, previously moistened, with lunar caustic. In a few days the contiguous parts lost all their tenderness, of which there had been a considerable degree, and the hardness was diminished. By a second application of the caustic the hardness disappeared, and a corn, which before required to be cut every few weeks, was, by two or three subsequent applications, kept from growing and exciting any uneasiness for several years.

Soon after this case occurred, the efficacy of the practice was strikingly exemplified by the application of the muriate of mercury to a corn. A patient who had several warts on the prepuce, to remove which he had tried various applications, at last came under my care; and I used, with success, the application of a saturated solution of the muriate of mercury in spirit of wine. Being at the same time much troubled with corns, and struck with the similarity of the two diseases, he thought he might try if the solution, which was so useful in removing the warts, would be as effectual in curing the corns.

He made the experiment, and met with the success he had anticipated.

From the frequency of the disease I have had many opportunities of recommending this practice, and I believe it has been universally followed with results equally successful. It is a remedy which, under no circumstances, can do harm, and those who have this troublesome complaint can easily receive such instructions as on all occasions to apply it themselves. I have generally directed them to cut off, with a sharp knife, or to tear out as much of the corn as they could do with safety: to keep the toe immersed for some time in warm water; and after drying all the skin contiguous to the disease, to rub over carefully all the surface of the corn with the caustic, or wet it with the solution of muriate of mercury, by means of a camel's hair pencil. Either of these applications, two or three times repeated after each of the eschars have separated, will in most instances be found sufficient to remove the corn; and when at any future period it has a tendency to grow again, the application of the caustic may be safely renewed.

§ IV. *Of the Treatment of Chilblain.*

There are many people in this country who suffer a great deal from chilblain, though it seldom occurs in the aggravated form which it so often assumes in more northern climates. It generally appears as an inflammation of a portion of the skin of some part of the extremities, and most frequently affects the heel and toes or outer edge of the foot. The redness is of a leaden hue, accompanied with swelling and an intolerable itchiness.

Though I am aware that stimulants are usually employed and are found useful in the treatment of this stage of *Pernio*, yet, as I have had opportunities of observing such remarkable benefit from the application of diluted tincture of cantharides, it may be worth while to mention in this place the effects and the mode of using this medicine.

One part of the common tincture of cantharides to six parts of the soap-liniment, is the form which I have found to answer; and it has seldom been found necessary to vary the

proportion of the medicine. The affected part of the skin is to be well rubbed once or twice a day with this embrocation, and afterwards kept warm. One or two applications usually remove all the itchiness, and after a few days the swelling and redness completely subside. As I have used this application in such a number of cases, and as it has been found equally successful in the practice of others, I have no hesitation in recommending it as a most useful and valuable remedy.

In the *second* stage of the disease, when vesications have formed on the skin, and ulceration has taken place, the cantharides will be found a beneficial application to the inflamed skin contiguous to the ulceration: it has a powerful effect in diminishing the swelling and thickening of the parts, which so often remain after frequent attacks of this disease. There is no application so useful to the ulcer itself as the common ointment composed of the red oxide of mercury.

Further Observations on the Cataract, by BENJAMIN TRAVERS, Esq.; Demonstrator of Anatomy at Guy's Hospital; Surgeon to the Hon. East India Company; and to the London Infirmary, for Diseases of the Eye.

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IN the paper which I had last year the honour of reading to the society, I attempted to convey an idea of certain appearances by which the various textures of cataracts might be distinguished, and which appeared to me to afford juster indications than could otherwise be obtained, of the modes of operation which they respectively require. The present communication contains the further results of my observation on this subject.

The classification of the different species of lenticular cataract which I have ventured to suggest, is to be understood as general, comprehending of course their intermediate degrees of consistency. The fluid cataract, for example, upon rending

its capsule, is sometimes readily diffused in the aqueous humour, so as to render it uniformly milky—at other times it is viscid and oily, and sinks to the bottom of the chamber, resembling the onyx of lymph or pus in appearance. The gradations of consistency between this and the state of flocculency are less obvious, although their existence is not less certain. The caseous species comprehends, under the description of its characters formerly given, a range of considerable extent, from the softness of the flocculent to a degree of firmness approaching that of the hard cataract. The former has the permeability to the needle and the facility of dissolution of the flocculent cataract, without its symmetrical, or its fanciful cloud-like arrangement; the latter has a gum-like tenacity and incompressibility, upon which the needle makes but a superficial impression, and which renders it incapable of a change of figure, although it wants the colour and seeming compactness of that which I have denominated "the hard cataract." These therefore I have regarded as the extremes of the caseous species. The appearances which they present differ according to the density of the opacity, which depends on their respective volume and texture. The best marks of discrimination, with which I am acquainted, are a uniform bright or luminous whiteness, and looseness or sponginess of texture, as indicating softness; and a dull white or bluish grey tint with a more condensed and less voluminous texture, the opposite state. There is an appearance of radii, corresponding to the segments into which the lens separates by maceration or compression, characteristic of the firm caseous cataract. These radii look like membranous bands passing at equal distances from the centre to the circumference of the lens. They are sometimes faintly marked, but always distinguishable, when present, from their superficial and glistening appearance. They are hence generally supposed to be capsular, but the capsule is uniformly transparent, and the cataract firm.

That a practical value attaches to these distinctions in selecting, and in the mode of conducting the operation, may be easily shewn, and my more matured experience has fully convinced me of their importance. In those of the fluid and flocculent character the diversity is insufficient to influence the mode of operating, and probably too minute to be ascertained by

previous inspection; and I am not aware that any advantage could be derived in the treatment of hard cataracts from a knowledge of their degree of hardness. But in attempting to couch the softer caseous cataract, the surgeon will find it break into pieces under the pressure of his needle; while, acting upon the firmer kind, his needle will sooner dislocate than divide it. This, it may be said, offers an alternative, of which equal advantage can be taken at the moment as by predetermination; for if the cataract prove soft, it may be broken up for absorption; if hard, the couching will be more easily effected. And this argument has been urged in preference of the operation with the needle over that with the knife, but it has been dictated by the necessity of the case, not by the judgment of the surgeon. I reply to it, 1st, That an unprepared state of mind, one that is undetermined which of two things it shall do, is the worst possible state for commencing an operation; for neither is done well, owing to an indecision which is the result of embarrassment between the two. 2d, That it is a severe disappointment to a patient to find, that in place of one he requires two operations, for the volume of the soft caseous cataract will require at the least two, and that he is to remain in darkness until the process of solution is effected; or on the other hand, though he receives light sooner than he expected, yet that it is succeeded by a severer inflammation, and a less perfect vision than he had been led to expect. I have myself caused such disappointments from mistaking the texture of the cataract, and have known patients who had made up their minds to one mode of operation, seriously regret that the other was adopted. The last and most important objection will be best understood when I have described the operations most applicable to the cases respectively. It will be at once admitted by those who agree with me, that a better operation than any with the needle is appropriate to one, if not to both cases; that the residence of the lens in the eye after its dislocation is an operation of all the most objectionable—destructive to the health and usefulness of the organ.

There is yet a description of lenticular cataract of too frequent occurrence to pass unnoticed, and which I shall call "the mixed cataract." I formerly adverted to the combination

of a fluid superficies with a caseous bed. Of this I have since seen several examples, and the instance of a caseous superficies covering a hard nucleus is yet more frequent. Wherever the centre of the lens has a tinge of colour, it is, according to my experience, a firm nucleus. It is faintly indicated, and discernible only on close inspection in different lights. It is discriminated from the hard cataract by its circumscribed extent and its obscurity, the surface through which it is seen presenting the general character of the caseous cataract.

A similar reasoning to that before employed is applicable here, and discovers the importance of ascertaining the existence of the mixed cataract before proceeding to the operation. The disappointment of the surgeon upon finding, after evacuating the fluid in one case, and breaking up the soft superficial lamellæ in the other, that much yet remains to be done, is not the greatest evil. The solid portion of lens, being unsupported by its capsule, advances, and a very serious and protracted inflammation results from its permanent pressure upon the margin of the pupil.

It has been a very general opinion among oculists, that the texture of the cataract is originally soft, and undergoes a progressive change from soft to hard. I am at a loss to conceive from what circumstances this opinion took its rise, unless from the observation that the texture of the cataract was different in persons of different ages.

The cataracts of infants and children are either fluid or flocculent; of young adults, usually of a flocculent or soft caseous consistence; of old persons, more frequently firm, caseous, or hard. Analogous to this is our observation of the texture of the healthy lens, which is semi-fluid in children, jelly-like in adults, and gum-like in old age. But is it to be supposed, that the progressive changes which accompany a state of organization and exercise, equally take place in the state of disorganization and disuse? I have operated on several congenital cataracts in adults, and have uniformly found them either fluid or flocculent.

The mixed cataract might possibly have suggested the opinion, that the cataract was in progress from soft to hard; but the same local relation of soft to hard is uniformly observed be-

tween the circumference and the centre of the healthy lens. I have never met with a soft nucleus covered by firm lamellæ.

The central opacity with a transparent circumference may have given or strengthened the impression; but the frequency of these cataracts in persons who, owing to the slight interruption which they give to vision, are ignorant of their existence until accidentally discovered, and their absolutely stationary character, lead me to the belief that they are congenital, and remain in the same state during life. Such persons have clear vision around the central spot. But persons in whom the disease is progressive, see through a mist, which they complain becomes more and more dense, before any opacity is distinctly visible. In a word, the consistency of the opaque lens, or portion of lens, does not admit of change when the opacity is once established. Whether fluid, or soft, or hard, it remains unchanged. If it originally affects only the nucleus of the lens, the circumference continues transparent.* This I imagine is referrible to its peculiar texture.

In general, at whatever period of life a cataract appears, it most nearly resembles the character in form and consistence proper to the healthy lens at that period. The doctrine of a progressive increase of consistency in lenticular cataracts, coupled with the inapplicability of couching or extraction to the soft cataract, has tended greatly to the prejudice of individuals afflicted with the disease. I have met with several unfortunate persons who have been kept in a state of blindness for years, under the expectation that their cataracts, supposed soft, would become *ripe*, (hard) and fit for an operation; which, until that change had taken place, was deemed unadviseable. "Rusticus expectat dum defluat amnis."

* The opinion that a distinct nucleated cataract is progressive, has been, and is a source of serious mischief. The patient who reads his newspaper with the aid of glasses, and can bring down his bird at the distance of fifty or sixty yards, is rendered miserable by the assurance that he will be shortly blind, unless he submits to an operation. I am not stating an imaginary case. One gentleman who did me the honour to consult me in this state, neglected my advice, and has since felt a bitter sense of its value. Another has resisted the most urgent solicitations to submit to an operation. Without imputing to operators in these cases any unworthy motive, I intreat them to reflect upon their proceeding, and examine the evidence for their opinions.

In the operation of couching, the lens is completely dislodged from the circle of the pupil posterior to the iris, for which purpose it is necessary that it should break and occupy a space in the vitreous body. If the cataract is of the firm caseous or hard kind, it may be depressed entire; but the capsule should be rent by the depression of the lens, that the latter may be sufficiently supported to preserve its direction as it descends; for if the capsule be lacerated by the needle in front of the lens, before the act of couching is commenced, the lens is unsteady and apt to revolve, and thus evade the needle. It frequently happens that some of the external lamellæ of the lens shell off in the couching; these should be dispersed before the needle is withdrawn. Upon remitting the pressure in order to disengage the needle, it often happens that the cataract rises; in this case it should be again depressed by a motion of the needle somewhat abrupt, so as to hitch it in the breach of the vitreous cells. In this operation the eye is left in a state to appearance more perfect than in any which is succeeded by the instant admission of light. There is no wound of the transparent part, no sensible escape of aqueous humour; and if the cataract is depressed *en masse*, the pupil is clear, though somewhat smaller than before. The vision enjoyed at the moment is likewise more perfect than where the humour has been entirely discharged and the cornea is wrinkled; and the demonstration of it more satisfactory, as the experiment of opening and directing the eye may be made without risk. For these reasons this operation has always been a favourite with itinerant oculists. An opake capsule is more favourable for this operation than one that is transparent: first, because the operator sees at once the whole extent of the disease with which he has to contend; and secondly, because the lens is uniformly opake, and commonly reduced in bulk, if the cataract is of long standing. The transparent capsule more readily lacerates; but as it is highly elastic in its texture, a less extent of laceration suffices for the escape of the lens, and the extent of the laceration is not distinctly ascertained; so that a considerable portion of it may remain within the area of the pupil, in a day or two afterwards become visible from its opacity, and ultimately occasion a necessity for a second operation. Besides, where the capsule is transparent, the external lamellæ of the lens are often in the

same state, so that the pupil is loaded with fragments after the opake portion has been depressed. These, however, as well as detached portions of capsule, are soon removed by absorption. A uniformly soft cataract, whether caseous or flocculent, cannot be couched; and although the nucleus of the mixed cataract may be depressed, the superjacent lamellæ will rise in the pupil and must be absorbed.

I have frequently performed this operation, and although my experience does not permit me to doubt that it is sometimes succeeded by useful vision, the same source of observation compels me to remark that the serious and lasting injury which the organ suffers, where the operation is satisfactorily completed, induces for the most part a slow but destructive inflammation, characterised by a tumid state of the palpebræ, a phlogosis and serous weeping of the conjunctiva, an immoveable and contracted pupil, muddiness of the humours, discoloration of the sclerotic towards its junction with the cornea, a periodical heavy pain in the region of the orbit, and a distressing sense of weakness in the organ. These symptoms are accompanied and succeeded by a dimness of vision very imperfectly relieved by glasses. In short, the condition of the eye, after the couching of an entire cataract, is too often that of a stationary imperfect amaurosis, the result of obstructed circulation and partial disorganization of the globe. This description will not be confounded with that of the acute inflammation, which directly supervenes upon most injuries inflicted by operation or accident. This I have seldom observed as a consequence of couching. On the contrary, the first few days are generally the best. The inflammation is comparatively slow in its accession as well as in its progress. I believe it results from the impediment to the internal or ciliary circulation, which the pressure of the dislocated lens creates. At least, I have repeatedly noticed the analogy between the morbid state of the eye produced by dislocation of the firm lens, whether accidentally in attempts to break down its structure, or designedly as in couching, whether its position be anterior or posterior to the iris. The choroid, and ciliary body, and iris, are the seat of the inflammation. When the lens, however bulky or firm in consistence, is extracted after its complete dislocation, no such inflammation ever ensues. When in process of time the lens,

favourably placed for solution, disappears, the organ recovers, though always slowly and imperfectly. The same process, which, during the pressure of the lens upon the iris, is visible to us—the effusion of lymph thickening and agglutinating its compressed fibres, and the deep discoloration of the sclerotic at its margin from the distension, or actual enlargement, and more abundant inosculation of the ciliary with the sclerotic and conjunctival orders of vessels—may afford us some idea of the effect of pressure and disturbed circulation in the choroid texture, and a probable explanation of the hidden mischief frequently done in couching.

But if we consider for a moment the theory of the operation, what more fortunate result are we entitled to expect from it? It would be a contradiction to all established principles in pathology to expect, that the opake crystalline could be wedged in the substance of the vitreous humour, and the organ recover its health. For the lens, though dislodged from its capsule, being unexposed to the aqueous humour, does not at once undergo absorption, but remains of permanent form and bulk in the bottom of the globe; where, after the vitreous humour has become partially absorbed and obliterated by its residence, it may sometimes be seen, floating behind the inferior border of the pupil. In horses, the depression of the lens is by no means unfrequent, whether caused by a blow dislodging the transparent lens, or by a process of absorption consequent to its opacity. However the case happens, the eye looks shrunken and wasted; a considerable interstitial absorption of the vitreous humour is found to have taken place, and other marks of disorganization usually appear. The animal is in this state as permanently blind, as if the cataract occupied the area of the pupil. In a word, the principle of removing a part no longer useful, is for obvious reasons more eligible than that which suffers it to remain at the expense of other textures. And the hazard attending extraction, cautiously performed, does not in my opinion counterbalance the certainty of partial disorganization induced by couching.*

* A method of couching by passing the needle through the inferior margin of the cornea, has lately been practised by M. Langenbeck, professor of sur-

The extraction of the solid cataract, it can never be questioned, is, cæteris paribus, greatly preferable to its solution in sitû. The former is effected by a single operation, the latter by a series; and the necessity of repeating an operation is an objection so weighty, as no equivalent short of unconditional security opposed to imminent hazard can reconcile; it must be always more or less permanently injurious to the organ. But on the other hand, the section of the cornea, to the extent of half its circumference, is an operation of the greatest possible delicacy, and in every stage of the treatment, so many unlooked for circumstances may, and occasionally do arise to baffle the intention of the surgeon, and expose the organ to irretrievable injury, that we cannot be surprised at the disposition evinced by men of honest minds and mature experience, to seek a substitute for the precarious advantages of dispatch and brilliancy of effect, in measures of slowness and safety.

Circumstances unfavourable to the operation of extraction are occasionally combined with forms of cataract, to which it is otherwise well adapted. One of the most formidable of these, as it appeared to me when I commenced the practice, was the convexity of the iris, and consequent narrowness of the anterior chamber, where the lens was bulky and of firm consistence. It is evident, that this figure of the iris will either materially limit the section of the cornea, or expose the iris to be wounded in the section. Frequently meeting with this difficulty, induced me to vary the mode of operating thus:—I first employed the belladonna to dilate the pupil, and then introducing a small spear-shaped needle behind the iris, I slit the capsule down the front of the lens perpendicularly, and repressed with my needle the superior margin of the lens, by which pressure its inferior margin was raised, and easily tilted over the edge of the dilated pupil, into the anterior chamber; here I left it resting against the cornea, and withdrew my needle. The eye was then closed, and a napkin thrown over it. After a minute or two, the upper lid was gently raised, and I made my section

gery at Gottingen, as I am informed by Dr. Mühry, physician to the king at the court of Hanover. I regard the operation as radically wrong in principle, and shall therefore be excused from a discussion of the merits of this, or any other mode of performing it.

boldly upon the lens, in conformity to the surgical practice of cutting upon an extraneous body, previously secured. By the interposition of the lens, the iris was effectually protected, and the cataract readily escaped as soon as the section was completed. This operation, which it will be seen differs from that of extraction as hitherto done, chiefly in having its stages reversed, I performed several times without difficulty, and with good success: the patients had no more than ordinary inflammation, and recovered excellent vision.* But in the progress of my experience, I found the pupil vary in its extent of dilatation under the influence of belladonna, and where the external lamellæ of the opake lens were soft, as in the mixed cataract, I found them separate under the pressure of the needle, which increased the difficulty of throwing the nucleus, as it sunk away from the pupil, into the anterior chamber. To remove the fragments of the cataract, it appeared superfluous to make the entire section of the cornea; I therefore carried the knife only half across the chamber, and withdrew it. The fragments floating in the aqueous humour, were at once evacuated with it; and upon introducing the scoop, and gently depressing the outer margin of the pupil with the back of it, the remaining portion was readily conducted along its groove, as the contents of an abscess follow the director. The success of this operation obtained more than once under circumstances nearly similar, the clearness of the pupil, and the perfect state of the iris, furnished a suggestion not to be overlooked, and led to what I am disposed to regard a material improvement in the operation for soft cataracts. I began my operation, having previously dilated the pupil, by the quarter section of the cornea, dipping the point of the knife into the pupil, and freely lacerating the capsule before withdrawing it. The fluid cataract was instantly evacuated with the aqueous humour. The flocculent cataract frequently passed out entire, taking an oblong shape, and the soft caseous cataract, piecemeal, through the hollow of the scoop, on gently depressing the margin of the pupil and sclerotic.

* I have a well written letter full of gratitude from one of these patients, a man between sixty and seventy, now before me, on both of whose eyes the operation was done in this way a twelve-month ago.

If the pieces were not all evacuated, the introduction of the capsule needle was found sufficient to clear the pupil, or they disappeared in a few days by absorption. The operation may be performed experimentally on the dead eye, and will be found to admit of the easy escape of the lens piecemeal.

One advantage of this operation over that which invites the solution of the cataract, is too obvious to require pointing out. Such an operation effects the object, which on an average requires two or even three of the latter. Its greater simplicity, and superior safety to that of extraction as commonly performed, appeared to me so decided, that I anxiously endeavoured to substitute it in cases of hard cataract. The first stage of the operation in this case consisted in dividing the lens by the needle introduced through the sclerotic tunic. The second, after a pause of two or three minutes, of the section of the cornea to the extent required for the extrication of the fragments by the scoop, which was introduced with its back to the iris, and very gently pressed upon the outer margin of the pupil. I soon found, however, that the firm lens could not be reduced to fragments, without a greater exertion of force, and the continuance of it for a longer time, than was consistent with the safety of the organ; and being inelastic, that it would not in any degree alter and accommodate its figure, and therefore required a section somewhat exceeding in extent its greatest diameter. And though the use of a larger and more powerful instrument might enable the operator to cut it in pieces—not to speak of the extent of injury which the use of such an instrument inflicts—the complete escape of the aqueous humour which follows its removal, and the consequent collapse of the cornea and iris, render the section of the former impracticable. Even if this were not the case, if the firm cataract were divided and subdivided, I greatly doubt if the pieces of a lens of this consistence could be extracted with facility through a simple incision of the cornea; and with the operation by which it is removed entire, this would certainly not admit of comparison.

The operation which I have described is similar to that performed and recommended in cases of soft cataract, by the late ingenious Mr. Gibson, of Manchester; whose death, like that

of all young men, ardent and able to improve their opportunities of information, must be regarded as a serious public calamity. Mr. Gibson's proposal was to extract the soft cataract through a large puncture or small incision of the cornea, having broken it in pieces by a former operation with the needle. But I do not find this previous measure necessary. This texture of cataract yields at once to the point of the knife or the curette. I have detailed the process of observation, by which I arrived at the operation, and had not recollected until reminded by a friend, that a similar plan had been adopted by Mr. Gibson. I am very happy to do him the justice of acknowledging his priority, and am every way gratified to discover, that although our observations were independent of each other, they conducted us to similar conclusions. I have performed this operation successfully upon infants, and where the capsule is opake and unadhering, I am disposed (provided the eye be not very unsteady, or the infant very unmanageable) to prefer it to the needle. But if the capsule is transparent, its contents are generally fluid, or of a consistence almost as permeable and easy of dispersion, and the operation with the needle passed through the cornea performed by the late Mr. Saunders, is, if properly executed, unexceptionable. I admit that in this operation there is less risk of injuring the iris, and deforming the pupil by adhesions. The needle is likewise a more convenient instrument than the knife for the free laceration of the capsule.

Where the contents of a transparent capsule are evacuated by an aperture of insufficient extent, as for example, a puncture, the membranous cataract which supervenes is very difficult of cure. The capsule heals, becomes adherent to the iris, and acquires a toughness which resists the needle. The iris yields to the pressure of the needle upon the capsule, and increases the difficulty. In such a case the operator should work at the centre of the membrane, and not attempt to break down the adhesions for the purpose of removing it entire. But by the completion of the capsular aperture in the first operation, the occurrence of a membranous cataract is effectually prevented.

Where the quarter section is performed, the knife should be carried somewhat obliquely through the lamellæ of the cornea, *i. e.* its point should be inclined to the pupil as it enters,

and should be withdrawn gradually, not hastily, after the capsule has been rent: but the operator should not begin to withdraw it until this object is accomplished. By these precautions the aqueous humour is retained, and the pupil preserves its dilatation, till the cataract is set at liberty; and the prolapsus iridis, which in neglect of them will sometimes occur, is effectually prevented. Where the capsule is opake, it generally escapes with the lens, and not a vestige of it can be seen within the pupil. In operating upon the adult after this manner, the surgeon should be careful to ascertain that the cataract is either fluid, flocculent, or of the softest caseous kind. If he should find that he has mistaken a firm for a soft cataract, the section of the cornea must be completed. The point of the knife should not penetrate the cornea at a less distance than one line from its margin, in any operation for which it is used.* If the iris should prolapse, it must be gently replaced with the back of the scoop. This may be done, if unfortunately it has not been sooner discovered, even as late as three or four days after the operation, as the adhesions are recent, and will yield to gentle pressure; upon the evacuation of the aqueous humour, the iris resumes and retains its place. But if the iris prolapses after the patient is bandaged, and put to bed, it takes place during the period of the secretion of the aqueous humour, being caused by the accumulation of this fluid behind it, which protrudes its overstretched fibres in the form of a little sac or bag between the lips of the wound, before the process of union is completed.

As it is of importance to the recovery of the pupil, as well as the healing of the wound, and the prevention of an acute inflammation, from the irritation which this protrusion causes, that it should be as early as possible replaced, I never permit the eye, in which from any cause the iris has prolapsed at the time of the operation, to remain unexamined on the second day, by which time the humour is secreted, for the purpose of ascertaining that the pupil is shapely, and the cornea healing. No evil results from this examination; but as the accident is

* The disposition to prolapsus iridis is increased, if not induced, by carrying the section too near to the margin of the cornea, by which its basis is deprived of support.

liable to occur in this interval, and cannot be redressed with equal ease or advantage at a later period, if at all, it should in no case be omitted.

I embrace the opportunity which this paper presents, of making a few remarks on the operation of extraction, as applicable to cataracts of firm consistence, in the hope that they may be useful to those who undertake it. It is quite unnecessary to offer a systematic description of its stages, after the copious and valuable instructions which the profession have received upon the subject from Richter, the Wenzels, and Mr. Ware. To convey an idea of the importance of performing this operation in that manner which admits of the removal of the cataract with facility, I need only remark, that I have never seen any extraordinary or untoward inflammation ensue, where the operation was so conducted. On the other hand, that I have scarcely ever known an instance of difficulty in the removal of the lens, in which the object of the operation was not in a great degree frustrated, or which was not succeeded by considerable inflammation, and consequent disorganization and deformity. The result being thus influenced by the circumstances of the operation, it becomes important to know from what cause the extraction is rendered difficult, and what the ill consequences are of which it is productive.

The cause of difficult extraction is an insufficient section of the cornea; the ill effect of it is the implication of the iris in the wound. I was formerly at a loss to know, why, after a tolerably well formed section of the cornea, and a sufficient aperture of the capsule, the lens showed no disposition to advance, upon applying a moderate pressure to the globe. By increasing the pressure in such a case, I found that the capsule of the vitreous humour yielded, and a portion of that humour escaped; the cataract having lost its support, sunk away from the pupil, and every introduction of the curette, hook, or scoop, increased the discharge. At other times, the lens advanced upon pressure of the globe, as it were reluctantly, became wedged in the section of the cornea, and was, by the continuance of the pressure, gradually but difficultly squeezed out.

In the first of these cases the section was not only not of extent sufficient for the mechanical expression of the lens, but the

divided portion of cornea formed so small a part of its circumference, that its resistance was but slightly diminished; and, except that the aqueous humour was evacuated, it in effect retained its integrity. In the second case the lens advanced, because this resistance was either greatly diminished or taken away, although the section was demonstrated to be barely sufficient for the escape of the lens. When I speak of the resistance of the cornea to the escape of the lens, I refer to its figure and its relation to the pupil through which the lens is to pass. It will be understood by observing the difference of effect produced by sections of the cornea, of the same extent, opposite to and at the greatest distance from the pupil. It is evident, that the situation of the section will be more favourable to the escape of the lens, the nearer it approaches to the pupil. I have seen some dexterous operators perform a straight section which just cleared the inferior margin of the pupil. Now if a crescentic section of the same extent were made at the inferior margin of the cornea, the extraction of the cataract could not be accomplished. The cornea being in the former case divided at its greatest diameter, its resistance is taken off, and therefore the lens will readily advance through a sufficient aperture of its capsule, although the wound of the cornea is obviously too confined;* but in the latter, the cornea retaining two-thirds of its circumference entire, the effect of pressure is only to preserve the contact between the iris and cornea, which took place on the evacuation of the aqueous humour, and to render the cornea a perfect valve upon the aperture of the pupil. That this is the effect it has, is demonstrated by a common occurrence, viz. the bulging of the iris at the inferior border of the pupil. The lens, upon pressure of the globe, being unable to pass the pupil, pushes this membrane before it, where it has lost its support by the division of the cornea. The operator, observing this, supposes that the capsule of the lens is imperfectly opened, and it may be so; but if it were removed entire from the face of the lens, the same thing would happen, and

* I am far from meaning to commend a section parallel to the lower border of the pupil; the fact is merely stated, that the reason may appear why the section of a proper situation and figure should also be of a proper extent.

continued or increased pressure have no other effect than that of continuing and increasing the distension and protrusion of the iris. If the section of the cornea be equal to its semicircumference, the effect of pressure is to dilate the pupil, and permit the escape of the lens. The iris has been supposed in some cases to resist the passage of the lens, and it is probable the opinion may have arisen from a circumstance similar to that which I have endeavoured to explain; but the truth is, that the iris is perfectly passive, and never, in my belief, forms an impediment to the passage of the lens, where it has lost the support of the cornea.

To give the section the situation and extent required, it should describe a curve similar to that of the margin of the cornea, equi-distant about one line from the sclerotic, commencing at the same distance above the transverse diameter of the cornea, and terminating a little below that diameter on the opposite side.

Incised wounds of the cornea are well disposed to heal by the adhesive inflammation, and the structure of that membrane is favourable to the close and complete apposition of their edges. A portion of the lymph uniting the cut surfaces is generally effused between the conjunctiva and cornea to a small distance beyond them, but this is in a little time absorbed, and the cicatrix becomes but faintly visible, forming a very delicate opake line. But if the lens has been forcibly delivered by a small section, the iris is compressed and bruised in its passage, and instead of recovering its plane, the lower border of the pupil falls between the edges of the wound, and partakes of the inflammation raised to heal it. It does not actually prolapse, but, by its intervention of the edges, forms a part of the cicatrix, so as to elevate the flap, and distort the figure of the cornea, and by its co-adhesion with the latter to render it more or less extensively opake from the section upwards. This tendency of the iris to inflame and unite with the cornea is universal, where it has been stretched, compressed, or bruised by the lens in its passage; the injury is often aggravated by the use of instruments to open the capsule and extricate the lens, which entangle in the iris, or abrade the cornea on its interior surface, so that the opacity eclipses the pupil; but where the iris has

been bulged and protruded by the lens during the operation in the manner before described, the prolapsus which ensues is sometimes of such magnitude as to draw the upper segment of the pupil into the wound, and thus completely to close it and obliterate the anterior chamber.

I have now pointed out, as faithfully and as clearly as I am able, what has appeared to me to be the principal cause of the difficult extraction of the cataract, and its consequences. The means of preventing it are sufficiently obvious; and it will be sincerely gratifying to me, if these observations should spare others the painful necessity of occasionally witnessing evils which they might have prevented, but are unable to relieve.

It is difficult in speaking of an operation, in the conduct of which so many minute circumstances demand attention, to refrain from entering into detail. On such points, however, few persons can be instructed with advantage, for all are competent, and in the course of their experience, compelled to form a judgment of their own; which will be more readily and more accurately formed by an appeal to practice than to books. One observation only, I will add, of general importance to the perfection of the operation. Some surgeons simply incise the capsule near to the lower border of the pupil, for the egress of the lens, and leave the remainder of it entire, occupying the centre of the pupil, in the expectation that it will remain transparent. This is not realized by the event; the capsule invariably turns opake after the escape of the lens, and renders the operation, for a time at least, imperfect. Whatever operation for the cataract is selected, whatever instrument is employed for the aperture of the capsule, it is essential that the central portion of this membrane should be extensively lacerated. To conclude, the operation of extraction by the section of the cornea in its semi-circumference, is the only one properly adapted to the firm caseous and hard cataract. Although pregnant with fortuitous and unexpected circumstances, embarrassing to surgeons, who have not enjoyed frequent opportunities of performing it, it offers no difficulty which coolness and perseverance will not soon overcome; and when executed with the confidence and adroitness which experience will infallibly give, it is, whether considered in design or in effect, one of the most

unexceptionable, if not the most perfect of our performances, in the department of operative surgery.

The following is a concise summary of the contents of this and the preceding memoir.

I. The various textures of cataract admit of distinction into capsular and lenticular, single or in combination. The lenticular cataract is either fluid, flocculent, caseous, hard, or of mixed consistence.

II. To the two former and the soft of the caseous species, the operation of forming a central aperture in the capsule, for the solution of the lens in the aqueous humor, is well adapted: to the firm of the caseous species and the two latter it is inapplicable.

III. The introduction of the needle through the cornea is preferable to passing it through the sclerotic, in performing this operation; except when, in consequence of a previous operation, or from other cause, the capsule is opake, and the lens has undergone a partial absorption, and lies at a distance from the pupil.

IV. The operation of couching, which is, strictly speaking, applicable only to firm caseous and hard cataracts, is objectionable on account of the injury done to the organ, admitted in the theory of the operation, and evidenced by a destructive inflammation, and an ultimately impaired state of the retina, by which it is frequently succeeded.

V. Where the space occupied by the aqueous humour is narrowed by the considerable convexity of the iris, the firm cataract may be dislodged from its capsule, placed in the anterior chamber by the needle, and safely extracted by a section of the cornea.

VI. The fluid, flocculent, soft caseous and unadhering capsular cataract, congenital or adult, may be safely and expeditiously extracted through a quarter section of the cornea, by freely opening the capsule with the point of the knife, and afterwards depressing the margin of the pupil with the back of the scoop.

VII. The extraction by a quarter section should never be

attempted but in cases where the consistence of the cataract is manifestly soft, as its success depends on the susceptibility of the cataract of a change of figure, or its ready escape piecemeal. It is better adapted to the opake capsule if unadhering, than the operation with the needle.

VIII. Where the capsule of the fluid, flocculent, and soft caseous cataract is transparent, the operation of extensively rending it and dissipating its contents with the needle passed through the cornea, is efficient, and leaves the pupil in the most perfect state.

IX. The mixed, firm caseous, and hard cataract require the section of the cornea in its semi-circumference, being unsusceptible of an alteration of figure.

X. The inflammation which follows the *easy* extraction of the cataract is never hazardous, very seldom severe. That which ensues after the *difficult* extraction, frustrates in a great degree, if not entirely, the object of the operation, though the cataract be completely removed.

XI. The cause of the difficulty is the insufficient aperture of the cornea; the consequence of it, the implication of the iris with the wound of the cornea, and the participation of the former in the inflammation of the latter: the consequent coadhesion of the two, and the partial or total obliteration of the anterior chamber, with diffused opacity, greater or less, of the cornea.

XII. The principle of the operation of extraction is unexceptionable: the section of the cornea should be every where about one line distant from the sclerotic; it should be crescentic, and should commence on a level with the superior border of the pupil. The aperture of the capsule should be large and central, by laceration, not by incision of that membrane.

I trust that the observations contained in this paper, may afford satisfactory evidence of the justness of the principle, which I have endeavoured to establish. I by no means assume, that my experience is sufficiently extensive, or my description and arrangement sufficiently accurate, to lead the surgeon up to a prompt and unfailing decision of the most appropriate operation in every case. The subject probably does not

admit of being reduced to unerring rules.* I have, however, pointed out a path, which I believe may be pursued with advantage; and if these observations should induce attention to the subject, I entertain no doubt that the several textures of cataract will ere long be distinguished with accuracy, and that thus the discretion of the surgeon, becoming subservient to his art, will render it in the highest degree efficacious.

* "Simple views, whether of health or disease, however ingenious, can seldom be just. They have their origin in the spirit of system, not in the careful study and faithful enumeration of the various and complicated circumstances, which concur in the production of all vital phenomena."—*Thomson's Lectures on Inflammation.*

SELECTED REVIEWS.

Observations on Pulmonary Consumption,

BY DR. SOUTHEY.

[From the London Monthly Magazine, for April, 1816.]

In our Bills of Mortality are registered only those births and burials which take place in London, and 12 miles around it; yet in this little spot of our island, in this fragment of our population, between 5 and 6000 persons annually die of consumption. Holycross, a little village in Shropshire, long held a population of only 1050. During the ten years between 1750 and 1760, forty-seven of its inhabitants died of consumption; but, from 1760 to 1770, there died of the same disease one hundred and one: in the former period it caused one-sixth, but in the latter one-third of the total mortality of the place. During seven years, between 1790 and 1796, six hundred and eighty three persons died of consumption at Bristol, and its relative mortality was as one to two; at Plymouth, during the seven years from 1799 to 1808, the relative fatality of consumption was as one to four.

When the kingdom is unusually healthy, there annually dies one out of every forty persons; if consumption does one-fifth of the whole work of mortality, of every two hundred inhabitants one dies consumptive every year. The total population of these islands has been moderately calculated at 16,000,000; consumption, therefore, annually destroys 80,000; thus, every day that passes over us, thirteen persons die of this disease in the metropolis alone, and upwards of two hundred and forty in the whole kingdom.

But figures never affect the feelings; numerical calculations go on in an unsensitive part of the mind; we cannot reckon and imagine at the same time. To place in a striking point of view the amount of its ravages, an eloquent writer, Dr. Southey, directs his reader to "ascend one of the high hills

that surround Bristol, to remark how closely the buildings are crowded together, for an extent of some miles; to descend from the eminence, and walk through its populous streets; to calculate the multitude that are met on the walk, and the still greater multitudes who are at the same time within the houses; and, when the imagination has thus grasped the idea of an immense assemblage of human beings, he is reminded, that a number equal to this assemblage perishes annually in our own island of this devouring malady."

What remedies have we for this disease? It has prevailed so long, and is occurring so perpetually, that the knowledge and the resources of the profession must have found their way to the public; and, we believe, they are pretty well aware, that, when consumption is fairly and fully established, there is no remedy on which we have the smallest reliance for efficacy, and that the greater number of medical practitioners aim at little more than alleviating the sufferings, and managing the minds of their patients; or, if they ever go further, and prescribe any of those remedies from which more sanguine spirits have promised a complete recovery, it is as a forlorn hope, and without the faintest expectation of success. In truth, there is at this time, throughout the profession, a hopeless indolence upon the subject. Physicians have no faith in their present remedies, and the subject is so unpromising, that they feel little inclination to search for new ones. This state of opinion must inevitably influence the conduct of the profession, and the patient, in return for his confidence and his fees, gets little more than prescriptions that have no power, and visits that carry no comfort.

The following statement of the varieties which occur in strumous phthisis, is well calculated to be highly interesting and useful to those practitioners who have had less extensive experience of the disease than Dr. Southey, or who are accustomed to regard it with a less scrutinizing eye.

"Sometimes the disease proceeds to its fatal termination without any pain in the chest, even upon the full inspiration. The difficulty of breathing also varies greatly; in some instances, the respiration becomes hurried and laborious, and all the auxiliary muscles are exerted early in the disease. In other

cases, the patient will require but a single pillow in the last stage. The dyspnœa sometimes becomes less after the suppuration has commenced. I have known two cases, in which the uneasy sensation in the throat was one of the most distressing symptoms, the patients being unabled to swallow any thing solid for some weeks before death. Portal records several cases in which the voice failed, and the organs of deglutition were affected; and, upon dissection, no change of structure could be discovered, except in the viscera of the thorax. The rapidity and degree in which the body wastes, vary in different individuals. In most instances, this is one of the first circumstances which excite alarm; but sometimes even this symptom is wanting, and fat has been found around some of the viscera of those who have died consumptive. The expectoration of pus, which, if any one symptom could deserve the name, might be considered a diagnostic of the disease, is not always present. In some instances, abscesses, which have proved fatal, have been found in the substance of the lungs, not communicating with the air-cells. Concretions of different kinds are often expectorated by phthisical patients, sometimes fleshy, sometimes osseous, and occasionally resembling a portion of the bronchia. Tulpius asserts, that he has seen pulmonary concretions, in which vascular ramifications could be distinctly traced. The membraneous substances often expectorated, and mistaken for portions of lung, are probably of the same nature as those which are formed in the larynx, and upper part of the trachea in croup. In one case of a young man, whom I attended in strumous phthisis, there was no expectoration of any kind till within a few days before his death; but, during the progress of the disease, he used frequently to vomit, after a violent fit of coughing, and then discharge a considerable accumulation of mixed pus and mucus. The exacerbations of fever are often well marked, but occasionally very irregular, and sometimes so slight as not to be noticed. I have seen one case in which no rigors were ever experienced, nor any profuse perspiration, till the last week. Aphthæ not unfrequently appear in the last stage. Morgagni, and more recently Portal, asserts, that some individuals have died of pulmonary consumption without ever having coughed. '*Est enim*,' says the former, '*aliquando in*

pulmonibus materia peccans nec pauca, et quæ expelli possit; sed nulla est tussis propter hebetem ac deficientem sensum in tunica intima bronchiorum.' The symptoms of strumous phthisis are therefore infinitely varied, and rarely occur in the exact order and connexion in which they are described by authors."

After describing the progress of the disease, the constitution in which it occurs, and the symptoms by which it is characterized, Dr. Southey proceeds to enquire into its external causes, beginning with a medical survey of the globe, in order to ascertain the degree in which consumption prevails in different regions; and those circumstances, such as climate, clothing, food and habits, to which its greater or lesser prevalence is to be attributed.

Dr. Southey sets out from the northern extremity of Europe. Honebow, Olafsen, and Povelsen, Sir George Mackenzie, and Mr. Hooker, all agree that consumption is one of the most prevalent diseases of Iceland; it is attributed to the severity of the climate, the hardships to which the inhabitants are exposed in fishing, and the little care they take to avoid wet and cold. Linnæus, in his Tour in Lapland, asserts, that among the Laplanders pleurisies are very common, but that consumption occurs only now and then. Dr. Guthrie and Dr. De Mertan practised many years in Russia, and assert, that pulmonary consumption is not a frequent disease there; the same also appears to be the case in Denmark. We are in the habit of associating together cold and consumption; this immunity from the disease in climates where the cold is so much more intense than in our own, is attributed by Lord Molesworth to their warm stoves, and the plenty and pureness of their beech-wood fuel, while its prevalence in London is referred to the gross and unwholesome fumes of our coal-fires. In the north of Germany, pulmonary consumption seems nearly as prevalent as in England; if you talk to a German, he is as familiar with *lungensucht* and *auszehrung*, as we are with consumption. In 1804 one-fifth of the deaths in the hospital at Berlin arose from consumption. The Dutch have a climate not warmer than ours, and their apartments are said to be large, airy, and what an Englishman would think chilly. Yet Dr. Cogan, who practised some years at Rotterdam, states,

that they are comparatively exempt from this disease. Finke, in his Medical Geography, makes a different statement, (on a Dutch authority:—"*Verhandelingen van de natuur en geneeskundige correspondentie opgericht in s'Hage.*" S. 98.) That, at the Hague, out of 1457 deaths, three hundred and eleven are from consumption; that is, more than one in five; and at Bergen-op-Zoom, out of one hundred and fifty-seven deaths, thirty-nine from the same disease; that is, nearly the same proportion: if, however, we may place any reliance on the assertions of Hollanders in this country, there can be no doubt of its comparative unfrequency among them. At Vienna, some say one-sixth, and others one-tenth of the deaths arise from consumption. In France, the disease appears to be prevalent, and is attributed by Finke to the thin dresses of the natives. The women (says he) think they must be ill to be interesting. "*J'ai aujourd'hui une santé indecente*," says a lady who feels herself thoroughly well; and in the spring, whatever may be the weather, they put on thin summer dresses, catch colds, and go into consumptions. That consumption is frequent at Paris, the evidence of Portal is sufficient,—at this very time, one of the most eminent physicians in the French metropolis. The south of France is often considered as a favourable climate for consumptive patients. Yet, at Lyons, the summer is very hot; the winter very cold, and diseases of the chest, particularly consumption, are frequent. Formerly, the consumptive in England were sent to Montpelier. Smollett long ago said, "that this senseless custom yearly costs many lives." "In Dauphiné, says Thierry, Erfahrungen, W.S.W.S. 44. the neighbouring Alps cause diseases of the chest; whoever has weak lungs, does not last long there; the dry tempestuous winds cause blood-spitting and consumption.

Consumption is well known throughout Italy; in the hospital of Santa Maria Nuova, at Florence, fitted up for 1200 patients, Domier found a number of consumptive. In Spain, it is well known, and is believed to be contagious; the bedding and clothes of those who die of it are burned; the same is the belief and practice of the Portuguese; they send their consumptive patients from Lisbon into Allentejo, particularly to Beja. The Maltese themselves are not subject to consumption,

but consumptive patients from England are injured by the climate; the same is said to be the case with Sicily, where the disease is known and believed to be contagious. The inhabitants of the Archipelago seldom suffer from pulmonary affections. In Egypt, the disease seems to be unknown; most travellers are silent about it; and Savary states, that it does not occur there. Celsus considered the climate of Alexandria as well suited to the phthisical. At the Cape of Good Hope, we learn, that consumption was one of the diseases most fatal to the English settlers. In Bengal, it is not common; though, in a European regiment stationed at Bombay, about six cases occurred annually. Chardin says, that the Persians are not subject to pulmonary complaints.

Crossing the Atlantic, Dr. Southey takes a view of the new continent.—"The Greenlanders (says Crantz) are subject to consumption and blood-spitting; many drag along several years with a weakness and defluxion on the breast, that suffocates them at last." In Canada, pleurisies appear among the prevailing diseases; consumption is not mentioned. Among the northern Indians, according to Hearne, it carries off great numbers of both sexes and all ages. In New England, it is very common; before the arrival of the English, it was one of the two disorders most fatal to the American Indians; and this is attributed by General Lincoln to the disuse of furs, which they sold instead of wearing. At Boston, consumption and dysentery are said to be the diseases of the place, and are attributed to obstructed perspiration. In Portsmouth, in New Hampshire, it appears that one-fifth of the deaths are caused by pulmonary consumption, and that it destroys in the same proportion at New York, and nearly the same at Philadelphia. According to Volney, among the most prevalent diseases throughout the United States, are colds and coughs, frequently terminating in consumption. In the West-India Islands, consumption is by no means a common complaint. In Jamaica, according to Hunter, it hardly ever occurs; and Lempriere says, that the climate was most favourable to the scrofulous, and those affected with pulmonary complaints. Du Tertre and Bryan Edwards corroborate the statement, that the disease is almost unknown in the West Indies. It is better known in

Barbadoes than in any other of the islands. Phthisis is common at Bermuda and the Azores. At Madeira, it appears, that it is one of the diseases to which the natives are most subject.

One of the first things which strike us in those nations, among whom consumption is most prevalent, is the deficiency of their clothing. The people, in the north of Europe, it is true, live in a climate of far greater inclemency, but how do they guard against the severity of the cold? (Phil. Trans. vol. 68.) "The legs and feet (says Dr. Guthrie, describing the winter dress of the Russian boor) are guarded against the cold by many piles of coarse flannel, with a pair of boots over all; at the same time, that their bodies feel all the warmth of sheep-skin coats, and nothing is left open to the action of the air but the face and neck; his wooden hut is caulked with moss, snug and close; it is furnished with an oven, which answers the triple purpose of heating the house, dressing the victuals, and supporting on its flat top the greasy matrass on which he and his wife lie; in the same apartment sleep the children, and secondary personages of the family: they undergo, during the night, a most stewing process from the heat and closeness of their situation; insomuch, that they have the appearance of being dipped in water, and raise a steam and smell in the room not offensive to themselves, but scarcely supportable to the person whom curiosity may lead thither." How different this to our thin clothing, and half-warmed apartments. In certain parts of our own island, consumption is said to have been more prevalent, as the clothing has become scanty. In many parts of Scotland, (says Sir J. Sinclair,) where consumption is now prevalent, the old people affirm, that it was unknown before the warm Scotch plaiding was exchanged for the fine, thin, cold, English cloth, and woollen for cotton. So, in the vale of Keswick, it has been observed, that consumption has increased with the increased use of cotton among the women, instead of worsted, flannels, and stuffs.

But, in our mode of living, thin clothing is not the only circumstance which disposes to consumption; some classes of our countrymen appear to be almost wholly exempt from it, while others suffer peculiarity. Those who are most exempt,

are those who eat animal food, live well, and whose occupation leads them to take strong exercise in the open air, such as butchers, Scotch fish-wives, Cornish fishermen, stable boys, grooms, and dragoons. Those classes suffer the most severely who are the worst fed, and lead sedentary lives, as tailors, weavers, spinners, &c.

These inferences are not without their value: to a people who suffer so severely as the English from pulmonary consumption, it is of importance to know, that the chief victims of this disease are not those who live in the most inclement climate, but those classes of a temperate climate, who are the worst clad, the worst fed, and the worst exercised; and that warm clothing, nourishing diet, and regular strong exercise, prevent that delicacy of constitution which disposes to the disease.

A General Dispensatory, or Arrangement of the Pharmacopœias of London, Edinburgh, and Dublin; in which the strength of various preparations is expressed by Pharmaceutical numbers; the different synonyms of each article, doses, qualities, Chemical numbers, &c. are likewise added: and to the whole are prefixed, some Observations upon the present state of the nomenclature of Pharmacy. By S. Rootsey, F.L.S. Bristol, printed for Baldwin, Cradock, and Co. London. pp. 142.

[From the London Medical and Physical Journal, for February, 1816.]

This is one of the most extraordinary little books we ever remember to have met with in the progress of our labours. In the space of about one hundred and fifty pages, more than half of which are devoted to *materia medica* and index, the author has actually accomplished all that he promises in his long title-page. After this observation, our readers will not expect us to offer an analysis of what is expressed with as much brevity as possible, and perhaps even in fewer words

on some occasions than could be wished. The title itself too shows the intention of every division. We must, therefore, content ourselves with short extracts, to show the manner in which so much is compressed into so short a compass. The preface will assist us a little; and, as it is short, we shall transcribe the whole.

"In writing the following work, my principal object was to explain my method of expressing the composition and the strength of various medicinal preparations by means of pharmaceutical numbers; and having been for some time in the constant use of what I conceived to be a more philosophical language of pharmacy, I determined upon uniting both of these ideas in one publication, and printing them in the form of a dispensatory as they now appear.

"The former presents us advantages so important and so obvious, that I consider no apology can be necessary for my making it known. But, as my own opinion of the necessity of nomenclatural reform may not with my contemporaries possess any weight, I shall adduce the opinions of some of those philosophers who are justly considered as high authority.

"I have been stimulated in my undertaking by the advice which the illustrious Bergman once gave to M. de Morveau: 'Spare no improper names, those who are learned will always be learned, and those who are ignorant will thus learn sooner.' And I may also urge as relevant to this point the arguments of the unfortunate Lavoisier, whose zeal and freedom in the promotion of science have never been surpassed. 'As ideas,' he justly observes, 'are preserved and communicated by means of words, it necessarily follows that we cannot improve the language of any science without at the same time improving the science itself; neither can we on the other hand improve a science without improving the language or nomenclature which belongs to it.'

"Sir H. Davy, who has devoted much of his attention to this subject, likewise judiciously remarks (p. 46 of his Elem.) that 'a theoretical nomenclature is liable to continued alterations; *oxygenated muriatic acid* is as improper a name as *dephlogisticated marine acid;* every school believes itself to be right; and if every school assumes to itself the liberty of alter-

ing the names of chemical substances in consequence of new ideas of their composition and decomposition, there can be no permanency in the language of the science, it must always be confused and uncertain.' And in his advertisement he says, ''till a more simple system is adopted, innovation will be censured, sometimes perhaps even when it is necessary, and neology generally brought forward as a reproach.'

"But still more weighty and impartial may appear to some, the arguments of Bacon and Locke, who flourished at an earlier period, and whose luminous writings have served, and should still serve, as a compass to direct our course in the promotion of philosophy. To those who possess the philosophic spirit of the former, or who are acquainted with his works, it will be unnecessary for me here to adduce what he has said 'de Idolis Fori.' And the latter has given us, in our vernacular tongue, several excellent rules as criteria of the imperfection of any particular language (of pharmacy for instance,) which are so much to the present purpose, that I cannot forbear to conclude with the following transcript from his essay upon the human understanding.

"'The ends of language,' he remarks, 'being chiefly these three—1, to make known one man's thoughts or ideas to another; 2, to do it with as much ease and quickness as possible; and 3, to convey the knowledge of things;—language is either abused or deficient when it fails of any of these three.' After treating at some length upon certain abuses, he thus proceeds:

"'To remedy the defects of speech before-mentioned in some degree, and to prevent the inconveniences that follow from them, I imagine the observation of these following rules may be of use. 1. A man should take care to use no word without a signification, no name without an idea for which he makes it stand. 2. The ideas he annexes to his words, if they be simple, must be clear and distinct; and, if complex, determinate. 3. Care must be taken to apply words as near as may be to such ideas as common use has annexed them. 4. Because men, in the improvement of their knowledge, come to have ideas different from the vulgar and ordinary received ones, for which they must either make new words, or else use old ones

in a new signification; therefore it is sometimes necessary, for the ascertaining the signification of words, to declare their meaning, where either common use has left it uncertain and loose, or where the term, being material, is liable to doubtfulness or mistake, which may be done by synonyms, by exhibition, by definitions, by drawings, and by adhering to one signification.' These remedies, he continues, are necessary to the improvement of philosophy; and 'though the market and exchange must be left to their own ways of talking, and gossipings must not be robbed of their ancient privilege; though the schools and men of argument would, perhaps, take it amiss to have any thing offered to abate the length or lessen the number of their disputes; yet those who pretend seriously to search after or maintain truth, should think themselves obliged to study how they might deliver themselves without doubtfulness or equivocation.' 'For he that uses words without any clear and steady meaning, only leads himself and others into errors; and, if he does it designedly, he ought to be looked on as an enemy to truth and knowledge.' "

Perhaps the author's having hit upon our favourite topic, and even concluded with a strong expression in favour of accurate language, may have induced for him a sympathy which may betray us into some partiality. This we trust, however, will be a venial offence. The following are his remarks on nomenclature, and his rules of etymology.

"LAWS OF NOMENCLATURE, which no author is at liberty to supersede, and which it is the duty of critics to see enforced. These laws are scattered over the writings of various authors upon language, and I have endeavoured to collect those which were necessary to my purpose. Linnæus, in his different works, has laid down many rules, so excellent, that as soon as they were promulgated they were generally embraced, and the impulse which was given to natural history by his writings will make his name eternally dear to its votaries. In the nomenclature of inorganic substances, the proposals of the French chemists, Lavoisier and others, have met with great approbation. But the discoveries which have been the consequence of nomenclatural reform, have rendered some changes necessary.

"The language of science, unfortunately, is not calculated

to be the language of business; and from the length of the names of organic substances, and uncertainty of those of inorganic, neither have been generally adopted in pharmacy; nor has any one succeeded in giving commercial names that have been universally approved of. Notwithstanding this, much has been written upon the subject, but it has commonly been to point out a few errors, and not to establish the whole upon a grand and lasting foundation. Finding, in the nomenclature of the three British pharmacopœias, important differences in many names, such as chamomile, blistering fly, &c. I found myself obligated to give my reasons for selecting those which I have preferred; and the manner in which I have executed this task will, I hope, exempt me from censure, considering that it is the duty of authors to use those names which they feel to be the most proper and the most classical. In doing this I have proceeded with caution, and have arranged the names of species according to my view of their classicality and propriety, by which it will appear, that my proposed alterations extend only to names indubitably aukward, uncommercial, or unclassical. It is certainly desirable that the language of pharmacy should be classical; and there are those who, 'in defiance of all undue authority,' will ever oppose the depravity and barbarism into which we are at present plunged, and which must ultimately be extirpated, so that the taste of the last age will be succeeded by another less corrupt.

"Law I. *When a name is once attached to a single species, it must not be given to another, except as an epithet.* In other words, *no name ought to be rendered equivocal, that is not so already.*

"Law II. *When a name, usually considered as generic, is used specially, it must be understood as implying the original species*, if it can be satisfactorily ascertained, and if not contrary to the generally-received opinion. It will also be necessary for the author who uses it in that sense to give some advertisement of it.

"Law III. *When a new species is introduced into commerce, it must have a new name of one word as pure as the Linnæan genera.*

"Law IV. *Names must be as classical as possible*, and it is

the duty of an author to choose and to adopt from amongst the synonyms of a species the best name with which he is acquainted.

"RULES OF ETYMOLOGY. I. The character by which a species is distinguished, such as its resemblance to something else, its quality or property, its colour, its use, or its native situation when constant, suggest the most appropriate names, as *Pterocarpas*, *Chenopodium*, *Dulcamara*, *Glycirrhiza*, *Erythrodanum*, *Pyrophorus*, *Origanum*, *Cydonia*.

"2. New names must always be of the second quality if possible, but never so bad as the sixth. If of the first quality, they are destitute of euphony.

"3. Modern writers have taken the liberty of naming species from their discoverers, as *Spigelia and Quassia;* but such as *Geoffroya*, *Witherites*, *Swietenia*, *Kraschenninikofia*, &c. are, in my opinion, rather too incongruous.

"4. Names in point of orthography and etymology must not be contrary to analogy, as Barytes for Barites, Ipecacuanha, for Ipecacuania, &c.

"5. Names must not be too long nor inappropriate, as Hypophyllocarpodendron, Spermaceti, Pulvis cretæ compositus cum opio, for Opium cretaceum compositum.

"6. The solution of an inorganic or chemical substance, including oils, essences, soaps, camphor, and the like, in a menstruum, may either receive a name from both, that of the solvend being in the genitive case, as Aqua calcis, lime-water; or the solvend may give an epithet to the menstruum, for salt water or solution of salt is rendered into Latin by Aqua salina probably better than by Aqua salis.

"7. If we suppose that the common names of salts are of this description, the acids may very properly be called Nitrate, Oxalate, &c.

"8. All organic preparations are to be named in the same manner as inorganic, except Decoctions, Infusions, Liquors, Elixirs, and Tinctures.

"9. In Pharmacy, water impregnated with any air or gas may take the name of that air or gas, as Murias, &c.

"10. When two or more articles are dissolved in a menstruum, the basis must be in the genitive case, and the other

must give an epithet, as Infusum sennæ tartarizatum, Tinctura cinchonæ composita. And, when a name contains no epithet, it must be considered as simple: for instance, Tinctura cardamomi," &c.

A section on definition follows, replete with method and accuracy; some remarks on *Icons*, referring to the descriptions, and where they are to be met with, the plates of writers on natural history; Synonymy.

The second chapter is inscribed Statics, and comprehends a correct and classical view of weights and measures. This is particularly useful, on account of the facility and brevity with which the three Pharmacopœias are connected. Either, however, we have overlooked the passage, or the author has omitted the thermometrical degrees in speaking of the cubical measures of liquids. This may be thought of less consequence, as all the parts must be similar to the whole; but still there seems to us the want of a standard.

Classification next attracts our attention. The two first divisions are zoology and botany; the third chemistry. In the progress of the work, the author shows ample cause for this last division, and the various subdivisions into which it is formed. In zoology, he recommends Turton and Bingley as the most convenient, though not complete, writers on those subjects. In botany, Sir J. E. Smith and Galpine. We think he might have stopt here; but in the space of two or three pages, he attempts an analysis of the Linnæan system. This is enough to show how familiar the author is with the subject, but can hardly be expected to satisfy a tyro. Chemistry comprehends chemical numbers,—a very ingenious and not less perspicuous little abstract of which is given; chemical attraction, with an illustrative table; specific gravities [in this place the author has fixed the thermometric point;] pharmaceutic numbers, which, being connected with the index, we shall transcribe.

"In considering the proportion which the solvend bears to the menstruum, I constantly take the solvend for unity, and the number for the menstruum I affix to the preparation. Thus, in preparing Tincture of Squills, four ounces are added to a quart, or thirty-two ounces of proof spirit, which being

eight times as much, I annex the number eight to that preparation. Again, the Edinburgh college direct Unguentum Cerussæ to be prepared by mixing one part ceruse with five of simple ointment, the number attached to that article must be therefore five. Thus it is evident that this plan, while it supersedes simple formulas, answer, the purposes of the table appended to the Pharmacopœias. For, if we turn to opium, we shall find one grain united to as many grains of other substances as the number indicates.

"This invention may be applied to the construction of a

SYNOPTICAL PHARMACOPOEIA,

which, from its smallness, may very conveniently be suspended in a library, dispensary, or shop; for which purpose, two copies will be given with each one of this work. This table will very much assist the memory in retaining the composition of medicines, and I have myself found it of very extensive service for some time past."

This division closes with a very useful contrivance for an easy reference to doses; and the chapter concludes with an explanation of the signs by which the authorities are marked in the different indexes.

The last chapter is on manipulation, and contains an useful little compendium. The materia medica follows, first alphabetically arranged, and afterwards remedially, in the manner of Dr. Cullen. The first of these is very copious, and requires a great deal of attention before it can be well understood. It is indeed connected with almost every other part of the book, both preceding and following it. When the reader has made himself master of it, he will find it extremely convenient on every occasion on which he wishes for information.

A list follows of those articles of materia medica which are usually imported, and of the places from which they are brought. Lastly a copious index and a synoptic pharmacopœia.

Such are the contents of a work, new in its kind, which must have cost the writer infinite trouble; and for which we, in common with the rest of his readers, are ready to acknowledge our obligations.

1. *Report together with the Minutes of Evidence, and an Appendix of Papers, from the Committee appointed to consider of Provision being made for the better Regulation of Madhouses in England.* Ordered by the House of Commons to be printed, 11th July, 1815. Each subject of Evidence arranged under its distinct Head, by J. B. Sharpe, Member of the Royal College of Surgeons, London.
2. *A Letter addressed to the Chairman of the Select Committee of the House of Commons, appointed to enquire into the State of Madhouses;* to which is subjoined Remarks on the Nature, Causes, and Cure of Mental Derangement. By Thomas Bakewell, Author of "A Domestic Guide in Cases of Insanity," and Keeper of Spring Vale Asylum, near Stone, Staffordshire.
3. *Practical Hints on the Construction and Economy of Pauper Lunatic Asylums.* Including Instructions to the Architects who offered Plans for the Wakefield Asylum, and a Sketch of the most approved Design. By Samuel Tuke.
4. *Observations on the Laws relating to Private Lunatic Asylums*, and particularly on a Bill for their alteration which passed the House of Commons in the year 1814.

[From the Eclectic Review, for March, 1816.]

AFTER a sanguinary conflict, especially when it has been of unusual and unexpected severity, as in the case of the victory of Waterloo, we hear with horror of numbers, who, although not the immediate victims of death on the field where they had fought and bled, nevertheless, subsequently lose their limbs and their lives for want of timely medicinal aid; and in consequence of that pressure and hurry in the business of healing, which directly succeed to the business of slaying. But the feelings which are excited by this consideration, must sink very low in comparison of those which are occasioned by the reflection, that mental soundness, and mental life, if we may so express it, are frequently lost for want of opportunity and of pecuniary resources, to preserve them. How many wretched beings do the wards of a public lunatic asylum en-

close, who, having been once as we are, are now reduced to a state of worse than brutal ferocity, uttering horrid blasphemies, and denouncing malignant menaces on all who pass by; but who, had their circumstances been such as to command the exercise of tenderness and skill equal to the exigencies of their cases, might now have been taking their places in the social circle formed by sympathy and affection, thinking, and feeling, and acting, like ourselves! In the great round of human misery and wo, there cannot surely be found any case that comes at all near to this in dreadful and heart-appalling interest.

That this statement is not a figment of the imagination, but a recital of facts, has been repeatedly asserted with all the confidence of conviction; and if such be the shocking state of things, in reference to lunatic hospitals, no wonder that, in this age of reformation and of public spirit, the attention of the legislature should have been called to the consideration of this momentous inquiry—'Whether the circumstances and treat-'ment of lunacy are susceptible of melioration and amend-'ment.'

This question has indeed been recently agitated in the British Senate, with an earnestness and interest which will command the admiration of posterity.

"The labours of Mr. Rose and his associates," (as is well observed in one of the pamphlets before us) "were labours of simple humanity and benevolence unmixed with party feeling, and of too partial an influence to produce them fame: while the unhappy objects of their compassion are shut out, perhaps for ever, from the world, and generally unable to express or even to feel gratitude. May they live (adds the writer) to receive the only reward they appear to aim at or desire, in the certainty that their completed deliberations and exertions have removed all the evils which occasioned them."

Before we proceed to a more detailed account of this investigation and its results, we shall say a few words on the recently much agitated inquiry, which immediately and obviously arises out of the preceding one, and which was repeatedly urged by the members of the committee of investigation in the course of their individual examinations. It is this—Whether is in-

sanity under the control of remedial agents, in the same manner as those maladies which are more properly and strictly regarded as affections of the bodily frame? Is madness to be cured by medicine? The remarkable discrepancy which was displayed before the committee, in reference to this very important question, must have necessarily excited some degree of scepticism, or at least of uncertainty, in the minds of those who entered upon the inquiry with anxious but unprejudiced minds. We are told by one person, a man of unquestioned talents and extensive experience, that he considers vomiting rather injurious than beneficial in cases of insanity; another, of equal experience, and of great name, stated his dependence upon the medicinal power of emetics; and in this opinion he is countenanced by a recent writer of great merit, on the subject of mental affections. One physician, who has directed his knowledge and attention principally to these unhappy affections, approves generally of venesection; a second, similarly circumstanced, describes this practice as fraught with extreme danger. Purgatives are the sole dependence of some, alteratives and tonics of others. This practitioner prescribes *warm*, that, *cold*-bathing. Some say little is to be done by *any* curative means; others, with even greater confidence, assert that *insanity is the most remedial of all the maladies to which man is heir.*

The fact is, we believe, that a great deal of this diversity of sentiment and opinion, has arisen in consequence of regarding the subject in too empirical a manner. Medical men talk of curing lunacy, as the vulgar speak of curing a cough. Indeed, while a generic term is made to include so many varieties, in relation to the causes upon which derangement depends, it cannot in strict propriety be made a question, whether insanity is, or is not curable. When a man receives a sabre wound on his skull, and consequently loses his senses, we are in the habit of considering the case without cure, from a general feeling, founded upon obvious truth, that as an organic lesion has here been the occasion of the deranged state of the intellect, it cannot be set to rights, because it is not within the compass of medicine or management to *re-organize*. Again, if part of the brain is annihilated by accident or disease, we cannot re-

store the lost *material*, nor by consequence its particular functions; or if a tumour grow in the interior of the encephalon, the derangement of functions to which it gives rise, is irremediable, inasmuch as the cause of the derangement is itself untangible. Now, our knowledge of sentient and intellectual faculties, as connected with structure, is so extremely limited; the knife of the anatomist does so very little in clearing away the obscurities which hang over sentient organization, that we may conceive of alterations quite as effective, and quite as permanent, as those just supposed, although they may not, even by any artificial means, be capable of being detected by our senses; and, in that case, the mental malady might be quite as hopeless, in respect to any prospect of recovery, as in instances where it has been dependent upon such palpable causes, as obviously to place it out of the possibility of cure. Disordered intellect, therefore, having in its display to do with the sentient system, of which our knowledge is so confined, cannot be calculated upon, either in respect to its essential nature, or any probability of advantage to be derived from treatment, with any thing like the accuracy with which we predicate the remedial nature or fatal tendency of mere bodily ailment.

Although it is not within the scope or intention of the present paper, to pursue the subject of insanity in the way of regular dissertation, we shall, we trust, be excused for adverting to one particular feature in the phenomena of deranged intellect, which we conceive has not been sufficiently recognized or dwelt upon, in investigations relative to the *rationale* of mental alienations. We allude to the alternate, and, as it were *vicarious* manner, in which diseases of the body and of the mind oftentimes succeed to, and take place of each other. In a pamphlet which Mr. Tuke some time since published, there is one remarkable example of this kind, which, from its very interesting nature, deserves recital.

"A young woman, who was employed as a domestic servant by the father of the relater when he was a boy, became insane, and at length sunk into a state of perfect idiocy. In this condition she remained for many years, when she was attacked by a typhus fever, and my friend, having then practised for

some time, attended her. He was surprised to observe, as the fever advanced, a development of the mental powers. *During that period of the fever when others were delirious, this patient was entirely rational.* She recognised, in the face of her medical attendant, the son of her old master, whom she had known so many years before; and she related many circumstances respecting his family, and others, which had happened to herself in her earlier days. But alas! it was only the gleam of reason; as the fever abated, clouds again enveloped her mind. She sunk into her former deplorable state, and remained in it till her death, which happened a few years afterwards."

Although this case must be considered as very extraordinary, the records of medicine are not wanting in instances of that kind of succession and alternation of mental and bodily disorder to which we have above referred, and of which the example just narrated is but a remarkable and forcible illustration. Dropsical and pulmonary affections have been seen to yield, in order to make way, in a manner, for the introduction of insanity; while this last has been expelled, in its turn, by the supervention and return of the original complaint. There is another circumstance, also, which is common to mental alienations, and which, indeed, is of so frequent occurrence, as to have been often noticed by many persons who were not professional observers; we allude to that sudden and transient restoration of the intellectual faculties, which not unfrequently immediately precedes bodily dissolution. After the mind has, to all appearance, been for years extinct, it bursts out from its corporal confinement, and casts a parting glance at the surrounding scene.

These facts demonstrate a frequent connexion between ailments of the body, and of the mind, as intimate as it is inscrutable; and serve to show that the human frame may be subject to such varieties of condition as to be productive of mental hallucination, although the precise nature of such state shall elude every research of the pathologist. As we are ignorant, then, of the nature, we must also be ignorant of the extent and probable duration of the morbid change. When, therefore, we find, as in some of the publications before us, individuals asserting with confidence the curable nature of insanity, and hinting,

that had this and that patient been under their care, the hallucinations would have disappeared, we cannot avoid regarding their assertions and intimations, as partaking in a large measure of empirical presumption. Which among them could have anticipated the circumstances and temporary cure of the idiotic girl above referred to? and who is there that could unravel the intricacies of the case by any ascertained physiological principle?

But there is another consideration, and it is one of a very momentous and imperative nature, which has still more to do with the late investigation; it is this—whether, even in cases of incurable lunacy, it be not possible to effect by conciliation and kindness, what has hitherto been often essayed to be done by coercion and restraint?—Is a madman out of the pale of humanity?—Is he, on account of the suspension of reason, to be treated as if the rational faculty were not obscured, but extinct? To these most important queries such replies have been made as to implicate, in their tendency, the conduct and character of several receptacles for the insane; it appeared, therefore to be the duty of an enlightened legislature to interfere further in behalf of this most afflicted portion of the human race. That interference, as we have above observed, has been candidly, rationally, and humanely made, and the publications before us are some of its consequences.

The legislature has had, however, a still further object in view, than that of securing an appropriate treatment, and as much comfort as is consistent with their situations, to those who are already and properly confined in consequence of mental disorder. Its aim has been directed towards placing a more effectual barrier, than the act already in force has been found to provide, against the commission of the enormous crime of unnecessary confinement; a crime which, to the eternal disgrace of human nature, has not only been in many instances conceived, but actually committed.

We shall not detain our readers with any very copious extracts from the published reports of the committee of investigation, especially as they have already been before the public in the prints of the day. We shall therefore confine ourselves to the selection of one or two examinations, which will serve to

show to those who may not hitherto have had their attention drawn to the subject, the great good that has already been effected by the business having been brought before the consideration of Parliament. The honourable Henry Grey Bennet, himself a member of the committee, presents to it the following evidence:—

"I visited Bethlem some years ago, and was then very much struck with the condition in which the patients were; there appeared to me to be the greatest coercion in general use; numbers were confined to the wall, fastened to benches and tables, and many of the patients were almost in a state of nudity: I visited it again last year in company with Mr. Wakefield, Mr. Lambton, and one or two other gentlemen; I found not so many patients in the same state of nakedness and restraint as at my last visit, but, in the women's wards up stairs, there were many of those unfortunate people chained to the wall in a small room, some of whom had been so chained for years during the day; the smell and dirt of the room were in the highest degree offensive; *amongst those persons was a woman of the name of Stone, who was formerly a governess in a respectable family, evidently a person of some accomplishments, who was chained to the wall, though she did not appear to be at that time or was stated ever to have been a furious maniac.* There was also a woman confined in a cell, chained to the wall at the end of the gallery; she had been so confined for several years, was in a state of furious agitation, and her voice and cries could be heard in all that part of the hospital. I saw also Norris; the iron apparatus in which he had been confined was then removed; but the chains which fastened the neck of the patient to the iron stanchion as well as the leg-lock, were still used.

"Norris stated, that he was fully aware he was a dangerous person; that he should be sorry to be permitted to walk unmanacled in the gallery; but if he could be prevented from doing others any mischief, which, if he was not provoked he should not attempt to do, he should consider the permission of taking that exercise a great indulgence; he added also, that he had made repeated complaints against the mode of confinement in which he had been for so many years; *but that he was*

now treated like a Christian, and that he felt himself quite comfortable. He particularly alluded to the pleasure he felt in being able to sit down on the edge of his bed; he was employed in reading the newspaper, and he asked me many questions on the subject of politics, in which he appeared to take the greatest interest. I visited Bethlem, on the 27th of May last, in company with other members of the House of Commons, Lord Lascelles, Mr. William Smith, Mr. Duncombe, Mr. Frankland Lewis, and Mr. Sturges Bourne. *The change that had taken place in the appearance of the patients in the Hospital was most striking;* on the men's side, no man was chained to the wall; only one was in bed, and he was ill; the patients were mostly walking about in the gallery, and the whole hospital was clean and sweet. On the women's side, two only, when we entered the hospital, were chained by the hand. *Miss Stone, who had been confined in the hospital for several years, three of which she had been chained during day-time to the wall, wrapped up in a flannel gown, was sitting by the fire dressed like a woman, employed in needle-work, and tolerably rational; she appeared cheerful, and contented, and most grateful to the matron, who accompanied us during our visit, for the change which had taken place in her situation.*"

"The woman who was confined at the end of the gallery the year before, in that violent state of irritation above mentioned, was now released, and was walking about the gallery, apparently tranquil; she repeatedly thanked the matron for her kindness, *and said it was owing to that kindness that she was in the composed and comfortable state in which we found her.* I have no doubt that the change which is so visible in the condition of the hospital, and in the mental improvement of the patients, has arisen from the different treatment that they have received from the new steward, Mr. Wallet, and the new matron, Mrs. Forbes. To any one who remembered the apparent neglect with which, the preceding year, these unfortunate persons were treated, this change in their condition was most consolatory."

In answer to a further question from the committee, whether he did not consider the iron apparatus worn by Norris to be unnecessarily heavy, Mr. Bennet replies,

"From what I have seen of furious maniacs in other hos-

pitals and places of confinement, I should have no hesitation in saying that it was a mode of restraint unnecessary and unwarranted. It has always appeared to me (he adds) from what I have seen of Bethlem, that the restraint was used there more from feelings of revenge than for purposes of medical cure."

The above evidence is a document of too unequivocal a nature, which establishes the fact that much abuse has existed; it serves at the same time to prove, beyond the possibility of dispute, that much may be done, with safety to the attendant and advantage to the patient, by kindness and conciliatory treatment. The only remaining inquiries then, at issue, are, by what means this treatment can be best secured to the unhappy sufferers under mental derangement; and what are the best measures to which the legislature can have recourse in order to prevent the practice of confining individuals upon groundless and false pretences.

It was a natural order of proceeding, in reference to the first particular, to establish an inquisition into the condition and usages of those several receptacles for the insane, that were already in existence; and by collating and contrasting their respective advantages and disadvantages, to come to such conclusions as should serve for a guide to future proceedings. Accordingly, the printed reports exhibit the interior of a great number of lunatic asylums, in some of which, as in the larger and more public establishments, were unveiled the most shocking mismanagement and the most culpable neglect. It is, however, gratifying to learn, from the accounts of others, that a conscientious skill and persevering humanity, were employed to effect one of the most momentous objects that can engage the energies of man. An account of a well-regulated establishment, called the Retreat, near York, instituted and conducted by the Society of Friends, has already been published, and our readers will hear with great satisfaction that this asylum has many rivals both in exterior and internal advantages.

Those institutions appear to be the most effectual in promoting the well-being of their inmates, in which attention is given to the following particulars. A due separation and classification of the patients according to their sex, their circum-

stances in life, and the degree of derangement to which they are subject; kindness joined with firmness on the part of the superintendents, with an endeavour, on the part of the superior officers, to excite the esteem and affection of the unhappy individuals over whom they are placed; such a construction of houses, as will ensure sufficient proximity of keepers and patients, and at the same time afford room enough for the latter, these apartments being as free from gloom and prison-like appearance, as is consistent with the nature of the establishment; ventilation without an undue exposure to the inclemencies of the weather; light, nourishing, and wholesome diet, to be regulated according to circumstances, both in respect to quantity and quality; cleanliness both in act and in habit; and lastly, a judicious regulation of mental and bodily exercise.

For the purpose of showing the very great good that may be done by a well regulated system of occupation, we shall be easily excused for transcribing the following extract from the examination of Mr. Finch, the keeper of an excellently planned and well conducted asylum at Laverstock, near Salisbury. The Committee ask this gentleman, whether the patients under his care are accustomed to take much exercise. In reply, he says,

'A great deal of exercise; I think it necessary to health; I was led to this remark by observing a few years ago that my pauper patients recovered in a greater number than those in a better situation in life, which I attributed to their being employed in my garden, in working, digging, &c.'

'"Is it your opinion," the Committee go on to say, "that the employment of the body contributes in a great degree to the restoration of the health of the mind?" "It is."

'"Is it your practice to allow patients of all descriptions, the more opulent as well as the paupers, to work and employ themselves in your garden?" "I allow them to work if they should be so inclined; but as I could not enforce that upon my superior patients, whose habits of life are not congenial with it, I substituted amusements to supply its place; such as bowling-greens, cricket, billiards, and all the different amusements which act upon the mind and keep the body in exercise; and

then I found a corresponding good attend the superior patient as well as the others."

' "Have you any doubt that the practice which has been so successful in your own establishment, might be as successfully adopted throughout the different public establishments?" "That is my idea; I do think so; I think they cannot be perfect without it; I can give a very strong case of a patient I had from St. Luke's; he was a man of opulence, sent there as a pauper, (and of course some other precluded from the advantages of the Institution,) he came to me afterwards as a gentleman with no increase of property: this man came to me a most miserable object from St. Luke's, after having been a twelvemonth, and discharged as incurable; he walked upon his toes; he could scarcely get from the coach to my house; the muscles of the legs were contracted; he was exceedingly nasty, and he would have eaten his own flesh had he not been prevented; he tore it immediately as he came to me; I tried to put him into a room where he could do no mischief to himself or any one else, *but took off every restraint;* I found him within a few days somewhat more composed; some little time afterwards he became so bad again with respect to filth, that I was obliged to use some restraint, and have a man constantly to watch him; by attending to his bowels, and keeping him strongly exercised in the garden and in the fields, I found him gaining strength daily; within six weeks capable of playing bowls; and I sent him home perfectly restored in four months, where he carried on the business of a coach proprietor three years afterwards, and called upon me many times in his gig, and thanked me for my attention to him."'

How melancholy to reflect that the poor clergyman described in the minutes of evidence on the York Asylum, was not placed under the care of Mr. Finch, or in an asylum of similar treatment; he would then probably have been restored to the blessings of intelligence and of life. Probably, we say, for we still protest against that *empirical dogmatism* which would pronounce an absolute *à priori* opinion on any case of mental malady.

But we hasten to give our readers a concise account of the remaining pamphlets whose title-pages are at the head of

this article. It is the design of the last of these to discuss the subject of legislative enactments, for the prevention and remedying of alleged and allowed abuses in lunatic establishments.

The practical hints of Mr. Tuke need not detain us long. The tract is sensible, and well written, and worthy the attention of those persons who are contemplating the erection or the alteration of houses for the insane.

'"The defects, (Mr. Tuke says,) in the construction of asylums which I have had opportunity to observe, have defeated one or other of the following objects, which appear to be of primary importance to the welfare and comfort of lunatics. 1st, The complete separation of male and female patients. 2nd, The separation of patients in proper number and distinct apartments, according to the state of their minds. 3d, A system of easy and constant superintendence over the patients, by their attendants, and over both by their superior officers. 4th, That the accommodation for the patients should be cheerful, and afford as much opportunity for voluntary change of place and variety of scene, as is compatible with security."'

These several heads the author enlarges and dwells upon with no small degree of characteristic simplicity and unaffected good sense. He proposes the following system of classification.

'"1st class, Those who are disposed to incoherent laughing and singing; and generally all those who are capable of very little rational enjoyment. 2d class, To consist of those who are capable of a considerable degree of rational enjoyment. In this class most of the melancholics and hypochondriacs will be included. Several of this class will be able to assist in the house or be engaged in some useful labour. 3d class, The convalescents, and those patients whose derangement leaves them fully capable of common enjoyment. A few of the best melancholics should also be admitted into this class."—We shall only add to our quotations from this tract the following important remarks.—"The worst patients require most attention, and are most likely to irritate their attendants. A distinct or very remote building, exposes them to all the evils of neglect and buse, and there is, generally speaking, more to fear *for*

than *from* them. The evils of *noise* are not so great as those of *filth*, *starvation*, and *cruelty*. I have no doubt, however, that it is possible so to construct rooms as to avoid the annoyance of the *many*, and the injury of the *few*."

The 'letter' of Mr. Bakewell is not without its merits, but his style and manner are too much tinctured with a sort of self-sufficiency and seemingly disappointed expectations. He proposes the establishment of 'National Hospitals for the *cure* 'of insanity alone; to admit none but recent cases, and to keep 'them only for a limited time;' the masters and servants to have liberal fees for every recovery, which fees should be 'entirely lost in cases of failure.' We should for ourselves apprehend, that this 'no cure no pay' system, would go far to exclude individuals of liberal education and enlightened minds, from undertaking the task of superintendence; and we feel quite sure that the poor sufferers would have so much less chance of benefit from medicine and management, as these qualifications should be wanting in the keepers of Madhouses.

It will not be worth while to follow Mr. Bakewell through his reasonings on the nature and essentials of insanity; we shall merely observe, that his practice appears, to say the least of it, quite as good as his theory; and, if we may trust to the correctness of his statements, his treatment is, on the whole, singularly successful. At the end of the pamphlet are several interesting, and somewhat instructive cases; the last of which, with his own remarks upon it, we shall lay before our readers. 'In the early part of a morning, before daylight, I was awoke by a loud knocking at the door; and upon going to the window, I saw by the light of the moon, a man upon his knees in a very loud prayer that the Lord Jesus would send down his grace upon the master of that house and all his family. Convinced from his manner that he was mad, and conceiving that a Madhouse was the fittest place for him, I called to say that I would let him in. On his entrance he was for a time very collected, and gave me his relation as follows; "I have been from home several weeks; I have been to attend the last illness and death of my poor father; he left some little property behind him, and we had some very unpleasant disputes; I

have, too, drunk hard, and the people said I was going mad; but bless the Lord, they were mistaken, for I was never so well in my life as now. Coming home upon one of the coaches, a voice came to me, and bid me go forth and preach the gospel of the Lord Jesus; I began to pray, and I got off at the village below, and have been praying for the dear souls of the people." "How came you up here?" I said. "Why the Lord Jesus directed me here, to be sure." "What! have you been some time with the Methodists, for I presume you are one?" "No, I never was with them in my life; I do not so much as know any Methodists; but if it please the Lord Jesus, I mean to join that holy people this very day; I shall find some of the preachers at Stone. In the strength of the Lord, I can do any thing: I can strike my arm through that fire; and I can strike my arm through your body." In about two minutes after this, his arms were properly secured in a straight waistcoat; on first seeing of which he expressed a wish to have it on, in order to convince us that the Lord Jesus would break his bonds asunder; and as soon as it was properly secured, he cried out—"Come, Lord Jesus, break my bonds asunder," accompanied with all the efforts in his power; but these not succeeding, he became calm again for a while. For two days, he was the most part visionary; but using all my efforts to remove his complaint, he seemed quite recovered on the fourth day, and appeared in his own natural character, viz. that of a bold profligate, with no more religion than the bird that bears his name (Swan.) I wish he *had been* a Methodist; for in that case I should have hope, that he would some time find grace enough to pay me my charge; but as it is, I have no hopes. I have often asserted that the visionary fervours of devotion, which have been stated as the *cause* of insanity, were frequently the first *effects* of it, and this is an instance. A contemporary writer on insanity, goes a little out of his way to stigmatize the Methodists as the frequent cause of insanity; and in walking with him through his own Hospital, which contained at that time about a hundred and fifty patients, he pointed out *two old women*, who were, he said, Methodists."

On this we shall leave the reader to make his own comments; and shall now dismiss the consideration of Mr. Bake-

well's tract, by merely remarking, that we think some credit is due to him for his courage in crying down the common cant—for *cant* it is—that religion is so much the occasion of madness.

The last in the list of the pamphlets under notice, is penned by no common hand. It contains in the first place a general sketch of the act of the 14th of his present Majesty, intituled, "an act for regulating Madhouses;" which is followed by an outline of the "Bill to repeal that act, and for making other provisions in lieu thereof," which passed through the House of Commons in the year 1814. The objections of the writer to this last bill are made against that part of it, in which it principally differs from the previous one, viz. to the mode of granting licenses, and the powers given to the visiters. We do not perceive the validity of his objections respecting the application of new laws to establishments already existing, for such an enforcement would not, as in the case of apothecaries and attorneys, deprive the individuals to whom they should apply, of their means of sustenance; and, it should be recollected, that one of the prime objects which the framers of the new bill had in view, was to correct *already existing* abuses in lunatic establishments.

Nor does it appear to us, that the person to be licensed must be so hardly dealt with by the discretionary powers being vested in the hands of the commissioners; for, independently of the circumstance of such commissioners being chosen from a liberal and respectable class of men, there would be very little apprehensions of sinister motives guiding their decision; inasmuch as the refusal of a license, or impediments of any kind to the present licentiate's views and wishes, would not be the act merely of one individual. It would appear, however, as far as relates to the laws of visiting, to be a greater safeguard to the rights of the masters of houses, were the visiting magistrates in the county districts required to be at least four instead of two in number; and it would be, perhaps, expedient, that two of these four should be selected from gentlemen resident in a part of the county distant from that in which the establishment existed; as too much care cannot be used to prevent the operation of local prejudices and

party interests. It is to be recollected that both Commissioners and visiters, in case of their decisions being inconsistent with justice, are liable to be convicted of improper conduct, by the act giving to the aggrieved person apower of appeal.

With respect to the right of removal being in the hands of the visiters, we think, upon the whole, that this is calculated to have a salutary effect as an *in terrorem* preventive of abuses; and it is not likely that the censors in question would very readily take upon themselves the heavy responsibility of ordering the liberation of any individual, unless the proofs of sanity were of too marked a character to admit of indecision or doubt.

That clause in the Act, which requires the visiters of asylums to direct that one or more accessible pumps be placed in certain parts of the premises, we think liable to all the objections which the author brings against it. We think too, that his charge of injustice is valid against that clause of the bill relating to payments of licenses for a part of the year, however small. But our limits prevent us from pursuing the subject further, and we shall now bring the discussion to a close, by again stating, in a very few words, our general sentiments respecting the treatment of insanity, and on what has been already, and ought further to be done, towards meliorating the condition of the unhappy subjects of mental derangement.

It will have been gathered from what has been advanced in the course of these pages, that our dependance on medicine, merely, is exceedingly small. There is a want of *tangible decision*, if we may so express it, in the pathology of lunacy; and its treatment must, by consequence, be, at present at least, in a great measure empirical. If any medicinal agents deserve to be preferred to others in affections of the mind, they are, perhaps, purgatives, regularly and perseveringly administered, and the warm-bath. Our few short extracts afford sufficient evidence of what is to be done by air, exercise, cleanliness, classification of patients, duly regulated bodily and mental occupation, and lastly, assiduous endeavours on the part of the superintendents to excite new trains of thought, and new habits and associations. It will have been remarked, that in

those establishments in which the above advantages were insured to the sufferers by the skill and humanity of the keepers, good was in the same proportion invariably effected.

In regard to legislative enactment, we really think that Mr. Rose's bill, a little modified, might effect all that is desirable to be done. There is, however, in our judgment, a loud call for County Establishments. These ought not to be optional, but compulsory, and each county should bear its own expenditure. The erections ought not to be suffered, until a plan of the building, its situation, and dimensions, shall have been presented to, and approved of by the commissioners of lunatic asylums. These buildings, when erected and occupied, should be subjected to precisely the same regulations and restrictions as the private asylums; and it would of course be desirable to avoid every expense that is not necessary to the comfort and well-being of the inmates of the respective houses. We may in conclusion express our belief, that a certain degree of reform must be the consequence of the investigation that has been excited, and of the regulations that are proposed; and although experience teaches us, in cases of this kind not to expect perfection, yet we feel convinced that much and lasting good will be conferred upon the community, by the recent labours of the House of Commons to improve the condition of Madhouses in England.

BIOGRAPHICAL NOTICE.

DIED, at his house in Sambrook-court, after a few days illness, aged 71, JOHN COAKLEY LETTSOM, M. D. F. R. S. &c. one of the ornaments of the age, a useful benefactor of mankind, a philanthropist in the truest sense of the word, and a man whose like the world will seldom witness. He was born in a small island near Tortola, about three miles in circumference, called Little Van Dyke, in the year 1744: his ancestors, on the father's side, originated from Letsom, or, as it is called in Doomsday-book, Ledsom, a small village in Cheshire: on the mother's side they are lineally descended from Sir Cæsar Coakley, an Irish baronet, whose family have uniformly possessed a seat in the parliament of that kingdom, the last of whom was Sir Vesey Coakley. When about six years of age he was sent to England for his education. His future destiny was determined by the accidental circumstance of his landing at a sea-port, where Mr. Samuel Fothergill, a celebrated preacher among the quakers, and own brother to the late distinguished physician of the same name, happened to be on a visit; and he was received into the very same house in which the preacher lodged. After leaving Dr. Sutcliff, he came to town, and assiduously attended St. Thomas's Hospital for two years; he then went back to his native soil, to take possession of a property which came to him by the death of his father, and elder brother, who, having contrived to run through an ample fortune, in a few years, left very little of the family estate to be inherited by the Doctor, except a number of negro slaves, whom, to his honour, he emancipated; and, in the twenty-third year of his age, as he has often told the writer of this article, found himself five hundred pounds worse than nothing. The fortune of Mr. Lettsom was henceforth, therefore, solely to be made as a medical practitioner; and, as difficulty begets exertion, so strenuous were his endeavours, and so extensive was his practice in Tortola, where he settled, that in a very short time, he was enabled to return to Europe, and to visit

the great medical schools of Paris, Edinburgh, and Leyden; at the latter of which universities he took his degree. To complete his education, he visited, besides Paris, most of the places of resort for the relief of invalids abroad; as Spa, in Westphalia, Aix-la-Chapelle, and various others. When he visited Paris, he carried, among other honourable recommendations, the following one from Dr. Franklin to Monsieur Dubourg.

Londres, 30 *Août*, 1760.

"* * * * * * * Cette lettre vous sera remise par le Docteur Lettsom, jeune médecin, amériquain de beaucoup de mérite, qui est de la paisible secte des Trembleurs, et que vous regarderiez conséquemment au moins comme une rareté à contempler, quand même vous auriez épousé toutes les préventions de la plûpart de vos compatriotes sur le compte de ces bonnes gens."—Œuvres de Franklin, tom. ii. p. 314. Paris, 1773. He was afterwards introduced to the celebrated Macquer, Le Roy, and other characters conspicuous at that period, and with whom he corresponded till their decease. He published the life of his friend Dubourg, in the first volume of the Memoirs of the Medical Society of London. After this circuit, he repaired to London, where he finally settled, with the undeviating friendship of his old guardian, and the patronage of his brother, the physician, whose life he has lived to publish to evince his gratitude. About the year 1769, he was admitted a member of the Royal College of Physicians; the year after, he was elected a fellow of the Society of Antiquaries; and in the year succeeding that, a fellow of the Royal Society. Amongst the most remarkable *public* services that Doctor Lettsom has rendered his country, was his contest *with*, and complete conquest *of*, the most famous of all the most famous water-doctors, the redoubted Mayersbach. Doctor Lettsom's writings are very numerous, as well moral as medical, and all of them discover the philanthropist and physician; the whole on the basis of public good. We are pleased with the opportunity of presenting a more accurate list of them than has yet been given:—

1. Reflections on the general Treatment and Cure of Fevers, 8vo. 1772. 2s.

2. The Natural History of the Tea-tree, with Observations on the Medical Qualities of Tea, and Effects of Tea-drinking. 4to. 1772. 4s.

3. The Naturalist and Traveller's Companion; containing instructions for collecting and preserving objects of natural history, 8vo. 1774. The second edition, 2s. 6d. The third edition, 1800. 4s.

4. Medical Memoirs of the General Dispensary in London. 8vo. 1774. 4s.

5. Improvement of Medicine in London, on the Basis of Public Good. 8vo. 1775. 1s. 6d.

6. Observations preparatory to the use of Dr. Mayersbach's Medicines, 8vo. 1776. The second edition, with an engraving of the Water-Doctor from Teniers. 1s. 6d.

7. History of the Origin of Medicine; and of the State of Physic prior to the Trojan War. An Oration delivered before the Medical Society of London, 4to. 1778. 6s.

8. Observations on the plan proposed for establishing a Dispensary and Medical Society, with Formulæ Medicamentorum Pauperibus præcipue accommodatæ. 8vo. 1772. 1s.

9. A Letter to Sir Robert Barker, Knt. F. R. S. and George Stacpoole, Esq. upon General Inoculation, 4to. 1779. 6d.

10. Hints, designed to promote Beneficence, Temperance, and Medical Science, 8vo. 1798. 5s.

11. Observations on Religious Persecution, 8vo. 1800. 6d.

12. Village Society, a sketch, 8vo. 1s.

13. The Works of John Fothergill, M. D. 3 vols. 8vo. and one volume 4to. 1784. 1l. 1s.

14. Memoirs of the Life of John Fothergill, M. D. 8vo. 6s.

15. Hints addressed to Card Parties, 8vo. 1779. 6d.

16. Observations on Human Dissections, 8vo. 1788. 1s.

17. Observations on the Cowpock, two editions, 1801. 8vo.

18. Hints on Beneficence, Temperance, and Medical Science, 3 vols. 8vo. 1801.

Besides various Medical Essays, &c. in the Philosophical Transactions—Memoirs of the Medical Society of London—Bath Society Memoirs, &c. &c.—In person Dr. Lettsom was tall, and always of a spare habit. There was not any of the graces in his manner or features; but there were a great

many of what is much better than any merely personal advantages have to bestow—the *benevolences* of a worthy heart, and the marks of a good understanding.—Dr. Edmund Fry has obligingly communicated to us the following particulars, and the originating cause of the death of this great and good man. "On Wednesday, Oct. 25, Dr. Lettsom was at my house, and I could not but observe that he seemed much indisposed; he informed me, that, on the preceding evening, he had been requested to be present at a dissection, to give his opinion on any morbid appearances that might arise; he was there detained about three hours with the cold body, in a very cold place, without any fire, or extra clothing; that he had, during the night, suffered, in consequence, a severe shivering for a long time. The succeeding night he had fever about six hours, of which he informed us when we saw him the next day; he was then evidently much worse, and so enfeebled, that with difficulty he walked up one pair of stairs. On the afternoon of this day I called to see him, but he being engaged with his daughter, I declined the invitation into the parlour; soon afterwards, he was first visited by Dr. Babington and his friend Wm. Norris, esq. the surgeon: his complaint was rheumatic, with some degree of fever, which seemed to indicate a need for the lancet; but, on preparing for the operation, a forbidding erysipelatous inflammation presented itself. His medical friends were unremitting in their attendance, but were very soon induced to think his case nearly hopeless: and, about the third day of his illness, the doctor himself intimated a doubt of his recovery: but it does not seem that he afterwards mentioned the subject. He expired about half past four on Wednesday morning, perfectly sensible to the last, and free from pain. Having of late years been much favoured with his friendship, I was one of the last of his friends who had an opportunity of conversing with him. At a late interview, he informed me, that, relative to the so-much-talked-of addition to his income, the pleadings before the Lord Chancellor were all concluded, and that his lordship was to give his decree on the matter this Term, when he should be put into possession of an independence, far beyond his wishes; but that the amount had been greatly exaggerated in the public papers. It gives me very

great pleasure just to add, that, the very last time I saw him, he mentioned the circumstance of his emancipating a number of slaves when he was young, and what happiness he should feel, should he live to do the same for those in his newly-acquired possessions."

Monthly Magazine, for December, 1816.

Biography of the late Dr. Denman.

[From the London Medical and Physical Journal, for January, 1816.]

Dr. Thomas Denman was born on the 27th of June, 1733, at Bakewell, in the county of Derby, and was the second son of a respectable apothecary in that town, where he was educated at the grammar school. His father died in the year 1752, and he for some time assisted his elder brother, who succeeded to the business; but in his 21st year he came, with the slender patrimony of 75*l.*, to London, where he attended St. George's Hospital several months, and two courses of lectures on anatomy. He then procured an appointment as surgeon's mate in the navy, and being made surgeon in 1757, through the interest of the Duchess Dowager of Devonshire, he, after a cruise of seventeen months off the coast of Africa, was appointed to the Edgar, a new 60-gun ship commanded by Captain, afterwards Admiral, Drake, with whom he continued, till, on the conclusion of peace in 1763, he left the navy. During his nine years' service, he formed many valuable friendships, which he preserved through life, particularly with the amiable and excellent officer whose name has been mentioned: his mind was enlarged by general reading, and by visiting various parts of the world; and, having been present at most of the important naval operations of that war, he materially improved his medical skill and knowledge. At the siege of the Havannah (as on a former occasion, when he assisted in the hospital at Gibraltar, then containing no less than 1100 patients), he contracted a dangerous illness, from too close an attendance on the sick and wounded. On returning to his na-

tive country, he continued, as before, to pursue his professional studies in London, and attended the Lectures on Midwifery then given by Dr. Smellie; but, obtaining, in 1764, a diploma from the University of Aberdeen, he endeavoured to establish himself at Winchester. This attempt proving unsuccessful, he again took up his residence in the metropolis, where his prospects were so little flattering, that he actually made an effort to resume the situation of a surgeon in the navy, but was unable to procure a warrant. Under these circumstances, the surgeoncy of one of the royal yachts, which he owed to the influence of Lord John Cavendish, and the friendly recommendation of Captain Drake, which brought a salary of 70*l.* a year, without materially affecting his London practice, afforded an important addition to his small income. About the same period he became more generally known by the publication of some medical tracts, and commenced those Lectures in Midwifery, in conjunction with the late Dr. Osborne, which they continued to deliver for fifteen years with great reputation. In the same year he was appointed joint physician and man-midwife to the Middlesex Hospital. With these aids, and by a rare union of patience, industry, and frugality, with an ardent temper, an independent spirit, an honest ambition, and singular zeal in his profession, he was enabled to emerge, by slow degrees, from obscurity to the extensive practice and eminent character which he so long enjoyed. He was appointed licentiate in midwifery by the College of Physicians in 1783, and six years after was elected an honorary member of the Edinburgh Royal Society. Dr. Denman's progress towards the first practice was, however, the more slow, because Dr. Hunter had long been in possession of the public confidence, and because Dr. Ford was at the same time in extensive business. But, when he had reached the summit of his branch of the profession, Dr. Denman kept his station with a firmness of which there have been few examples. This arose from his full and well grounded knowledge, from his strong natural sagacity, from the most perfect uprightness of conduct, and from the benevolence of his character. In 1791, Dr. Denman purchased a small country-house at Feltham, near Hounslow, and in some measure withdrew from business; but he

never quitted it entirely, and to the latest period of his life, preserving the unabated confidence of the public, he may be truly said to have possessed that of the members of his own profession even in a greater degree. At the very advanced period to which he lived, he retained, to a wonderful extent, the vigour of his body, and, quite unimpaired, the vigour of his mind; but what is still more singular, he retained also, without decay, all the kindly affections of his nature, with all the cheerful animation of youth, and exercised an active benevolence to the very last.

In the year 1770, Dr. Denman married Elizabeth, the youngest daughter of Alexander Brodie, a respectable linen draper in London,—a companion well suited to him from the uprightness of her mind, the soundness of her religious principles, and the benevolence of her character. They had a son and two daughters: his wife and all his children survive him.

It is believed that Dr. Denman's earliest publication was a treatise on Puerperal Fever, which appeared about the year 1770, and was soon followed by a Letter to Dr. Huck on the construction and use of Vapour Baths. From this period, he was constantly in the habit of printing short tracts on subjects connected with his branch of the profession; which have been, from time to time, incorporated in the several editions of his Aphorisms on the application and use of the Forceps and Vectis, and of his Introduction to the practice of Midwifery, both of which works are too well known in the medical world to require, in this place, particular notice. They have each gone through five editions; and a sixth of the latter was nearly prepared at the time of the author's death. One of the former editions of it was in quarto, and was accompanied by fifteen engravings, made at very considerable expense, on the generation and parturition of the Human Species, and of Animals. The preface, independently of its professional merits, exhibits much general knowledge and information, and has been highly estimated by good judges as a literary composition. The work has been translated into French, and in that language also is believed to have passed through more than one edition.

Several papers, written by Dr. Denman, will be found in the 5th, 7th, and 11th volumes of the London Medical Journal,

conducted by Dr. Foart Simmons. After the publication was discontinued, he became a frequent contributor to the London Medical and Physical Journal. He was among the first to recognize the important discovery of his friend and pupil Dr. Jenner; and having satisfied his own mind of its truth and utility, he did not hesitate to announce his conviction, and to support it by some striking facts, the result of his own inquiries, at a time when vaccination had made a comparatively small progress in public opinion. Two letters by him on this subject appeared in the 3d and 4th volumes of the work last mentioned. Communications more immediately connected with his own pursuits were published in the 2d and 14th volumes. In the 27th he wrote a paper on the Structure of Cancerous Parts, and a Description of a curious case of Polypus; and in the 34th another paper on Cancer.

He published in 1809, in the 3d volume of the Transactions of a Society for the Improvement of Medical and Surgical Knowledge, a very valuable paper on Excrescences of the Womb; and in 1810, a pamphlet consisting of treatises on the Rupture of the Uterus, on the Snuffles in Infants, and on Mania Lactea.

Dr. Denman always felt a strong desire to discover a remedy for cancer, and deemed it almost criminal in medical men to despair of an object so interesting to humanity. To pronounce that dreadful disease incurable, he thought was in some degree to make it so; and his mind was continually on the watch for information on the subject. In 1801, indeed, he was instrumental in forming a charity for the exclusive relief of persons afflicted with cancer, and recommended it by a circular paper, which may be considered as an admirable specimen of the method to be pursued in conducting medical enquiries. Some account of that establishment, which was given up after a trial of a few years, is contained in a pamphlet "on the Cure of Cancer," published by him in 1810: in the following year he wrote observations in this Journal on the review of his pamphlet, which it had given. When Mr. Young made public his mode of treating cancer, Dr. Denman was disposed to flatter himself that this great end was on the eve of being accomplished; he gratuitously attended several patients under the

care of that gentleman, in order to become acquainted with his practice; and, having thus ascertained that it was both innocent and beneficial, and believing that it held forth a fair promise of the most important consequences, he introduced it to the public attention by a letter which was inserted in the October number of this Journal. With the same view, he prepared for the press a second edition of his pamphlet on the subject, subjoining a full statement of Mr. Young's system, and his own remarks upon it.

Good sense and practical utility are the leading features in all Dr. D.'s compositions. They not only explain with clearness what had been before discovered, and add the sanction of the author's experience, where it accords with former opinions, but they perform the still more valuable service of correcting such opinions when found to be erroneous, and of enriching the stock of previous knowledge with original observations. It may be stated in particular, that the formidable disease in children called the malignant snuffles, was very little known till it was described by Dr. Denman, who had also the good fortune to point out a mode of treating it, which is generally successful. The evolution of the child, in certain circumstances, by the action of the uterus, is a most curious and important fact, first discovered by him. He was the first also who recommended, in cases of retroverted uterus, the frequent emptying of the urinary bladder by a catheter, as all that was necessary for the restoration of the womb to its proper position. The excitement of premature labour, for the preservation both of the mother and the child, in certain cases of deformed pelvis, is a most important operation suggested by him, which has been successful in almost every instance where it has been adopted. In convulsions preceding labour, particularly where the pulse is slow, he recommended copious bleeding, instead of nervous medicines, and advised that there should be no artificial delivery, until the head of the child shall have passed through the os uteri. These are examples of important practical improvement, which will preserve Dr. Denman's name in remembrance, and give him a just claim to the gratitude of posterity.

This enumeration of his works is most probably incomplete:

but those which have been mentioned will sufficiently prove that the author was constantly employed in endeavoring to improve the medical art, and diminish the extent of human suffering. It is apprehended that they also exhibit an understanding peculiarly gifted with all the faculties, and regulated by all the dispositions, that are most favorable to the investigation of truth. And, when it is remembered that they were all composed in the midst of unceasing professional engagements, always severe, and frequently both harassing and afflicting, they will be allowed to evince an unwearied activity and perseverance in the pursuit of benevolent and useful objects, which are excelled only by the motives that prompted their exertion.

Dec. 22, 1815.

Biographical Notice of W. Nicholson.

[From the London Monthly Magazine, for April, 1816.]

Mr. W. Nicholson, whose death was recently announced, was born in 1753, in London, where his father practised the law, as a solicitor in the Inner Temple. The son received his education at a school in the north of Yorkshire; but at the age of sixteen he entered into the East India service, in which he made two voyages before the year 1773. He was afterwards employed in the country trade in India; but, in 1776, he was engaged on the continent as a commercial agent to the late Mr. Wedgewood. Soon after this he settled in London, and became a teacher of mathematics; to which profession he added that of an author, translating from the French with great facility, and publishing, besides many useful compilations of his own, chiefly on historical and scientific subjects. In 1781 he printed an "Introduction to Natural Philosophy," in two volumes octavo; which work was well received. In the year following Mr. Nicholson published a new edition of Ralph's Survey of the Public Buildings of London and Westminster, with additions. In 1784 he brought out his "Navigator's As-

sistant, containing the theory and practice of navigation," in one volume octavo. In 1786 we find him publishing, "An Abstract of the Acts relative to the exportation of Wool;" to which subject he was led by his acquaintance with the clothiers. The next year he printed a "Review of the Controversy between Kirwan and the French Academicians on the subject of Phlogiston;" and in the Philosophical Transactions for the same year, is a paper of his containing, "The principles and illustration of a method of arranging the differences of Logarithms, on lines graduated for the purpose of computation." In the following volumes of the Transactions, are two papers of Mr. Nicholson's, one, "The description of an Instrument which produces the two states of electricity without friction, or communication with the earth;" the other, "Experiments and Observations on Electricity." In 1788 appeared his translation of Fourcroy's Elements of Natural History and Chemistry, in four volumes octavo; to which, the year following, he added a supplemental volume, "On the first principles of Chemistry." In 1790 Mr. Nicholson translated from the original manuscript, "Memoirs and Travels of the Count de Benyowsky," two volumes, quarto. The next year came the translation of Chaptal's Elements of Chemistry, in three volumes octavo. In 1795 appeared, "The Dictionary of Chemistry," in two quarto volumes; and, two years afterwards, the first number of his "Journal of Natural Philosophy, Chemistry, and the Arts;" which was printed originally in the quarto form, but was afterwards changed to an octavo. About the year 1799 he opened an establishment in Soho for twenty pupils, which institution he carried on several years; but it at last declined, chiefly owing, as we believe, to the attention paid by Mr. Nicholson to other objects; particularly the West Middlesex Water-works, the plan of which originated with him, as did that for the supply of Portsmouth and Gosport. He was also engaged in a similar undertaking for the borough of Southwark; and, besides these different concerns, he prepared drafts of patents for mechanical inventions. In 1799 he printed a work translated from the Spanish, "On the Bleaching of Cotton Goods, by oxygenated muriatic acid;" and, in 1801, appeared, "A general System of Chemical Knowledge, with a set of synoptic tables from

the French of Fourcroy," in two volumes octavo, and one in folio. In 1808, he printed "A Dictionary of Chemistry," in one closely-printed volume octavo; and this was followed by another work with his name, entitled, "The British Encyclopedia," in six volumes octavo, in which he had little personal trouble, but it is false that the same person wrote this and the similar work of Dr. George Gregory; the latter gentleman having diligently superintended the Cyclopedia which bears his name, though aided by various co-operation. In 1810 Mr. Nicholson had some dispute relative to the work in which he was employed, as engineer to the Portsea Island Water-work Company, on which he published, "A Letter to the Proprietors of the Portsea Water-works, occasioned by an application made to them by the Assigns under an act for bringing water from Farlington." This truly ingenious and indefatigable man shared the common fate of projectors, to be continually employed without enjoying any material advantage from his labours. Though incessantly occupied in useful concerns, and ardent in promoting the interests of science, he was generally embarrassed in his circumstances; and, notwithstanding his uncommon industry, he lived in trouble, and died poor.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

FOR THE ECLECTIC REPERTORY.

The Editors are pleased to have it in their power to lay before their readers, the following interesting Communication from Dr. Physick, which has just been handed to them. Had it been sooner received it would have occupied a more appropriate place in this Number.

HAVING repeatedly experienced considerable delay in the healing of wounds from ligatures applied on divided arteries remaining a long time in the sore before they could be removed, I have for many years been very desirous of avoiding such an inconvenience in the use of ligatures. With this view, the first idea that occurred was that of drawing the ligature tight on the vessel by the assistance of a double canula: unfortunately, the first patient on whom it was employed for securing the femoral artery, died of tetanus; and though I by no means believe the disease to have been occasioned by the instrument, yet the event discouraged from further trials of it.

Several years ago, recollecting how completely leather straps, spread with adhesive plaster, and applied over wounds for the purpose of keeping their sides in contact, were dissolved by the fluids discharged from the wound, it appeared to me that ligatures might be made of leather, or of some other animal substance, with which the sides of a blood-vessel could be compressed for a sufficient time to prevent hemorrhage; that such ligatures would be dissolved after a few days, and would be evacuated with the discharge from the cavity of the wound.

Under this impression, I requested Dr. Dorsey to try the experiment on a horse, by using a ligature of buckskin. This was found to answer every purpose, and came away in a few days.

This fact was mentioned at the time to several of my medical acquaintance; and I understand that Dr. Hartshorne has lately tied up some of the arteries after amputating the thigh, with ligatures of parchment. They were found dissolved at

the first dressing. Dr. Dorsey, in several operations, in which I have assisted, has used ligatures of French kid, which he finds stronger than any other leather. He has it cut into narrow strips, stretches them and peels off the coloured polished surface. No hemorrhage has taken place in any instance, and the ligatures are found dissolved at the end of two or three days.

With the view of ascertaining what animal substance would withstand the solvent power of pus for the longest time, I suggested the plan of trying different articles, by applying them over the surfaces of ulcers. Buckskin, kid, parchment, and catgut, have been tried in this way. The buckskin and kid dissolved first; then the parchment; when at the same time the catgut was but little changed. From an apprehension that in tying large blood-vessels the leather might dissolve too soon, I have requested Dr. Dorsey, to try leather impregnated with the varnish used by Mr. Bishop of this city, in making elastic catheters; in the hope that when so prepared it will be somewhat more durable. Perhaps tendon would be found to answer the purpose. Future experiments will probably place at the command of the surgeon a variety of these ligatures, which may be so selected as to remain the exact length of time he may require.

This hasty notice on the subject is given, because it is thought important that these facts should be made public without delay.

P. S. PHYSICK.

Philadelphia, July 9, 1816.

FOR THE ECLECTIC REPERTORY.

A STONE was extracted from the bladder of a patient in the Pennsylvania Hospital on the 8th July, by Dr. Dorsey, which was found to have concreted round a mass of lead an inch in length and nearly half an inch in width. This singular nucleus consists of two laminæ of thick sheet lead, weighing two drachms

and thirty-eight grains. The patient, an intelligent man, declared himself unable to imagine any way in which it could have reached his bladder. Its size and irregular shape would certainly render it difficult to introduce it through the urethra; and yet scarcely a doubt can exist that it originally entered by that passage. The stone was soft and not unusually large.

FOR THE ECLECTIC REPERTORY.

Upas Tree.

The following extract from the Diary of an intelligent fellow-citizen will be read with interest, as the accuracy of the relation may be relied on; and it is only by actual and unprejudiced observation, that the true nature of this wonderful production will be rightly understood.

In the morning we rode out to see the *Upas Tree*, with the sap of which the Malays poison their weapons. It is about three miles from the town of Balawangie or Balemboang, on the south-east end of the island of Java, and is much loftier than the tallest Lombardy poplar; the branches begin to grow from the trunk like the palm tree, at a considerable distance from the ground. I had an opportunity of proving, by ocular demonstration, that the accounts which we have had of its destroying the vegetation and killing any birds that may fly over it, are totally without foundation. I was myself under the tree a considerable time, rubbed my hand over the trunk, and saw birds fly on and off without any injury. The vegetation around it is remarkably luxuriant, extending to the very root of the tree.

The poison is extracted by making an incision in the trunk and catching the sap in a bamboo, and that it is deadly in the extreme I had an opportunity of proving. A bamboo, sharpened into the size and shape of the blade of a small penknife, was dipped in the sap and stuck in the leg of a dog, tied by a long string to a tree; in five minutes he began to be very much agitated; in ten he was in strong convulsions; in sixteen he

was raving mad, frothed at the mouth, and appeared in the greatest agony; this lasted about five minutes, when he sunk down exhausted: he lay a few moments apparently dead, when he again sprung up raving mad, foaming at the mouth for a minute or two, when he gave a yell and expired.

The tree was covered with numerous incisions, where the Javanese had been extracting the poison. There are but two of these trees on the island, one about one hundred miles from Batavia, and the one above mentioned. There are two kinds of the Upas Poison; the one, it is said, only affects quadrupeds and does not injure fowls of any kind, and the other *vice versa*.

Extract from Diary, October 10th, 1815.

An Ordinance providing for the gratuitous Vaccination of Persons in indigent circumstances.

WHEREAS it hath been sufficiently established, that VACCINE VIRUS, when effectually communicated to the human system, is a preventive of SMALL POX, and it being a duty to contribute to the extension of this distinguished blessing—Therefore,

Sect. 1. *Be it ordained and enacted by the Citizens of Philadelphia, in Select and Common Councils assembled:* That the City shall be divided into four districts, as follows, viz. East and West by the centre of Delaware Eighth street, and North and South by the centre of High street.

Sect. 2. *And be it further ordained and enacted by the authority aforesaid*, That the Mayor be, and is hereby authorized, immediately after the passing of this act, and annually hereafter in the month of January, to appoint one qualified person for each of the said Districts, whose duty it shall be to call upon each and every family resident within his District, and inquire of every such family, whether any, and if any, what members thereof may be liable to Small Pox disease: and if it be found that any person should be so liable, being in

indigent circumstances and unable to defray the expense, to offer the services of the Physicians of the Corporation to Vaccinate such gratuitously, and if the said offer b accepted, the Collector of cases shall proceed to record the number of the house, and the name or names of such persons, in a Book, alphabetically arranged, to be provided and kept for that purpose.

Sect. 3. *And be it further ordained and enacted by the authority aforesaid*, That the collector of cases shall, at least once in each week, make two fair transcripts of the names and residence of the persons entered in his original Book of Record during that time; one of which copies shall be filed in the Office of the City Clerk, and the other furnished to the Physician appointed to have charge of the District to which the said Collector shall belong.

Sect. 4. *And be it further ordained and enacted by the authority aforesaid*, That for the services required to be performed by the Collectors, in virtue of this Ordinance, they shall, for every case procured to be vaccinated by them, be paid the sum of ten cents; and upon their quarterly presentation of their accounts to the Mayor, certified by the City Clerk, that the number of cases charged therein are filed in his Office, he shall draw his warrant on the Treasurer, directing, for the present year, that the same be charged to account of any Monies in the Treasury, not otherwise appropriated, and for every year hereafter, to such fund as Councils may assign for that purpose.

Sect. 5. *And be it further ordained and enacted by the authority aforesaid*, That immediately after the passing of this Ordinance, and annually hereafter in the month of January, the Mayor be, and he is hereby authorized, to appoint four respectable Physicians, who shall have conferred on them, Degrees of Doctor in Medicine in the University of Pennsylvania; and assign one of the said Physicians to each of the Districts erected by the first section of this Ordinance, whose duty it shall be, upon receiving the List of cases furnished by the Collector, to Vaccinate each and every person so reported to him, at their respective places of abode, and continue to visit every such patient as often as may be necessary to enable him to as-

certain, whether the person or persons so vaccinated have passed through the said Vaccine disease.

Sect. 6. *And be it further ordained and enacted by the authority aforesaid*, That each of the Physicians hereby provided to be appointed, shall keep a Book, wherein shall be recorded, the name, age, and place of residence of every person he shall vaccinate, stating whether the patient has had the Vaccine disease, or not, with such other notes as in his judgment it may be proper to preserve; and the said Physicians are hereby required and enjoined, at the expiration of every three months, calculating the commencement from and after the day of their appointment, to make a fair copy of the Records made in their Books, during the term of each three months, and deposit the said transcript for safe keeping in the Office of the City Clerk. And it shall be the duty of the said Clerk, annually, to publish a Statement of the number of patients thus vaccinated in each District, with the name of the Physician by whom they were vaccinated.

Sect. 7. *And be it further ordained and enacted by the authority aforesaid*, That in consideration of the services to be performed by the Physicians, to be appointed for carrying this Ordinance into effect, they shall each be paid one hundred dollars per annum; and the Mayor is hereby empowered to draw his warrant on the Treasurer, quarterly, if desired, in favour of the said Physicians; directing, for the present year, that the same be charged to account of Monies in the Treasury, not otherwise appropriated, and annually hereafter, to such fund as Councils may apply to the purpose.

Enacted into an Ordinance at the City of Philadelphia, on the thirty-first day of May, in the year of our Lord one thousand eight hundred and sixteen.

JAMES S. SMITH,
President of the Common Council.

ROBERT RITCHIE,
President of the Select Council.

JOHN C. LOWBER,
Clerk of the Common Council.

Vaccination in Hayti.

FEBRUARY 8, 1816. We have great satisfaction in announcing that we this day enjoy the blessing of Vaccination; and that we need no longer dread the ravages, in our warm country, of that insatiate scourge, the Small Pox.

Mr. Prince Saunders, lately arrived from London, has brought out the Vaccine fluid; with authentic documents from Mr. Moore, the Director General of Vaccination in England, for its use. Mr. Saunders has already vaccinated the children in the palace of Sans Souci; and his Majesty has directed all the physicians of Hayti to take instructions from him on the subject. He has also ordered, that establishments be made in all the parishes for the effectual vaccination of all the inhabitants liable to the infection of Small Pox.

We are informed, on good authority, that we are indebted for this great blessing, under God, to the virtuous Mr. WILBERFORCE, the venerable father of the abolition of the Slave Trade. This great man—whose labours are all directed to the promotion of human happiness—when he learned that Vaccination had not been introduced into Hayti, expressly engaged Mr. Prince Saunders, who was then on the point of embarking, to suspend his voyage, in order to gain instruction in the art of Vaccination, for the sole purpose of introducing the blessing into Hayti.

PROCEEDINGS OF PHILOSOPHICAL SOCIETIES.

[From the Annals of Philosophy, for March, 1816.]

ROYAL SOCIETY.

On Thursday the 25th of January a paper by Sir Humphry Davy was read, containing further experiments on the effect of wire sieves to prevent the combustion of gases from passing through them. A sieve formed of wire $\frac{1}{50}$th of an inch in diameter, and containing 10 wires in the inch, prevented the

combustion from penetrating; but when agitated in an exploding mixture explosion took place. The explosion likewise took place when the wire became red-hot. When there were 14 wires to the inch, agitation did not occasion an explosion. With 24 wires to the inch, the mixture did not explode even when the wire became red-hot. The author accounts for these singular phenomena in this manner. A red-hot wire of a considerable size is required to produce an explosion in gases; hence, when the wire is very small, explosion does not take place, even when the wire becomes red-hot. The gas will not explode till it acquires a certain temperature. Now in the experiments with the wire sieves this temperature only takes place at the top, where the gas is so much diluted with azote and carbonic acid gas, that it is incapable of exploding.

At the same meeting a paper by Dr. Wilson Philips was partly read, containing experiments on the nervous influence in secretion. In two former papers he had shown, that the circulation of the blood and the action of the muscles were independent of the nervous influence, and that this influence only acted on the muscles like any other stimulus. But the case is very different with the secretions. Whenever the nervous influence is interrupted the secretion is at an end. Several rabbits had the eighth pair of nerves divided, and in all of them the parsley, which they ate after the operations, remained in the stomachs quite unaltered, and exactly resembled parsley chopped small with a knife. The stomach was always much distended, and a portion of the food was contained in the œsophagus. This was owing to the unsuccessful attempts which the animal made to vomit, which always follow the division of the eighth pair. The animal soon shows a violent dyspnœa, and seems to die at last of suffocation.

Since the experiments of Galvani on animals, it has been a favourite opinion of many physiologists that the nervous influence is the same with galvanism. To put this to the test of experiment, a portion of the hair of a rabbit opposite to the stomach was shaved, a shilling tied on it, the eighth pair was divided and the extremities of the nerve coated with tinfoil. These were connected with a galvanic battery of 47 pairs of plates four inches square. The trough was filled with a liquid com-

posed of one part muriatic acid and seven parts water. This action was kept up for 26 hours. No dyspnœa took place, and after death the food in the stomach was found as much digested as in the stomach of a healthy rabbit which had eaten food at the same time. The smell of the parsley was destroyed, and the smell existed which is peculiar to the stomach of a rabbit during digestion. This experiment was several times repeated with the same result. So that it appears that the galvanic energy is capable of supplying the place of the nervous influence, so that while under it the stomach digests food as usual.

Mr. Wilson likewise made a number of experiments to show that heat is a secretion from the blood produced by means of the nervous energy. When new drawn blood is subjected to the action of the galvanic battery, it continues several degrees hotter than blood not subjected to the same process.

It appears to me that Mr. Wilson has gone rather farther than his experiments will warrant, when he concludes that the nervous influence and galvanism are the same. It is clear that the section of the nerve interrupts the nervous influence. Mr. Wilson's experiments (supposing them correct) show us that galvanism puts an end to this interruption. But it may do this merely by serving as a conductor to the nervous influence.

On Thursday, the 1st of February, Dr. Wilson Philips' paper was continued: he considers it as proved by his experiments that the ganglia communicate to the nerves proceeding from them the general influence of the brain and spinal mar row. Nerves proceeding from them supply all the involuntary muscles. But if this be the case, it will be asked, how comes the digestive power of the stomach to be destroyed by cutting the eighth pair of nerves, seeing that the stomach is supplied with nerves from ganglia? The eighth pair coming from the largest portion of the nervous matter possesses the greatest influence; but the digestive power of the stomach is weakened likewise by the interruption of the nerves proceeding from ganglia. This he proved by destroying part of the lower portion of the spinal marrow of different rabbits. In every case the digestive power of the stomach was impaired or destroyed; the urinary bladder and rectum lost the power of discharging their contents, and paralysis of the lower extremities ensued,

anda great degree of cold took place. The heat of one rabbit before death sunk as low as 75°. Though the power of the stomach as an organ of digestion is destroyed by cutting the eighth pair of nerves, still its muscular power remains; but it does not act as usual, because the stimulus of digested food is wanting; or it acts so as to throw the food out of the stomach the wrong way, in consequence of the unnatural stimulus of undigested food.

On Thursday, the 8th of February, Dr. Wilson Philips' paper was concluded. He showed that the heat of animals was in all probability owing to the nervous energy. He finished his paper with a general view of the facts which he had established in the three papers which he had laid before the Royal Society. The muscular energy depends upon the particular structure of the muscles; the nervous system is supported by the sanguiferous; but the sanguiferous can act without the influence of the nervous system. Secretion and animal heat are entirely dependent upon the nervous system. Hence the muscles cannot for any length of time continue to exert their energy if the nervous influence be cut off. The nervous influence appears the same with the galvanic energy.

At the same meeting a paper by Dr. Brewster, on the structure of the crystals of fluor spar and common salt, was read. Haüy had observed that all minerals whose primitive forms were symmetrical, as in the cube and tetrahedron, refract singly; these figures belong to fluate of lime, common salt, alum, &c. Biot first attempted to give a reason for this curious circumstance. He observed that doubly refracting crystals act upon light two ways; some draw it nearer the axis, while others repel it to a greater distance: the first exert an attractive, the second kind a repulsive force. The crystal of fluor spar, &c. according to Biot, are intermediate between the other two, and therefore neither attract nor repel. Dr. Brewster found that crystals of fluor spar and common salt, in certain cases, depolarize light, in others not. Whenever any deviation from the exact figure of the crystal takes place, they acquire the power of depolarizing; and the deviation may be either towards the side of attraction or repulsion.

On Thursday, the 15th of February, a paper by Mr. Tod,

surgeon in the navy, was read, containing some experiments and observations on the torpedo electricus. While the ship Lion, in which Mr. Tod was, lay at the Cape of Good Hope, a considerable number of this fish was caught by the seine, but none by the line, though they fished with every kind of bait in the very place where the fish was caught by the seine. When caught, it was put into a tub of water, where it lived usually three, and in one case, five days. Mr. Tod in the paper gives a description of the fish, and mentions its general size, which is known to be small. The fish discharged the electric energy at pleasure, and it ceased with the life of the animal. When caught, it attempted in the first place to make its escape by muscular exertion, and did not exert its electric energy till it found the first attempt unsuccessful. A motion of the eye of the fish was generally perceptible when it exerted its energy, so that Mr. Tod could generally tell when the shock was given to another person who held the animal in his hand; the shock never reached farther than the shoulder, and often not farther than the elbow.

At the same meeting, two papers by the Rev. Abraham Robertson, D.D.F.R.S. were announced: the first giving a method of calculating the excentric from the mean anomaly of a planet; the second containing a demonstration of Dr. Maskelyne's method of finding the longitude and latitude of a celestial object from its right ascension, and *vice versa;* and pointing out two mistakes to which Dr. Maskelyne's method is liable.

On Thursday, the 22d of February, a paper by Sir Everard Home was read, giving an account of the mechanism of the feet of an East India species of lizard, which is capable, like the common fly, of walking up and down the perpendicular face of smooth walls without falling. This mechanism consists in a particular muscular contrivance, by which a quantity of air contained between the wall and the foot of the animal, enclosed within a kind of cartilaginous ring, is rarefied so much as to enable the foot of the animal to adhere with sufficient force to support the whole weight of the body. This rarefaction is continued without any muscular exertion after it has once taken place. There can be little doubt that the foo

of the fly is constructed in the same way, though its size is so small that nothing can be determined by inspecting it with the naked eye. When high magnifying powers are employed, the observer is so liable to be deceived by appearances that nothing very precise can be determined on the subject.

LINNÆAN SOCIETY.

At the meetings of the society on the 6th and the 20th of February, a paper was read by Robert Brown, Esq. librarian to the society, containing general observations on the tribe of plants called Compositæ. This paper contained many curious remarks upon the structure of the flowers of this difficult tribe of plants, marked by the precision and sagacity which characterize all the papers of this acute observer; but of so miscellaneous a nature that it is scarcely possible to give any abstract of it without transgressing our usual limits.

ROYAL INSTITUTE OF FRANCE.

Account of the Labours of the Class of Mathematical and Physical Sciences of the Royal Institute of France during the year 1815.

PHYSICAL DEPARTMENT.—*By M. le Chevalier Cuvier, Perpetual Secretary.*

Another year of devastation and terror! The bloody discord of our new country, the existence of this fine kingdom brought into doubt, the repose and the fortune of the most peaceable citizens for some time without protection or security; innumerable armies inundating our provinces, taking possession of our towns, seizing by violence in the midst of a conquered capital those treasures of the arts formerly collected in a manner equally violent. Such, to the most innocent, have been the consequences of a too culpable attempt. But the sciences bring with them a state of consolation and tranquillity. At present all nations respect them. In the midst of the tumult of arms, our Archimedes have nothing to fear from enlight-

ened soldiers, to whom their names and their labours are known, and who rejoice to become for a short time their disciples. It is perhaps even in the most terrible moments that, taking refuge in profound meditation, emancipating themselves by the exaltation of their minds from the horrors that surround them, they have made some of the most fortunate combinations, and some of the most fruitful discoveries. We shall find, at least, that the list of the labours of this year is not inferior to that of the most peaceable time.

Chemistry.

We have been speaking for two years of those acids without oxygen, or, as they are now called, *hydracids*, which have made so considerable a breach in the imposing chemical edifice of Lavoisier. The labours of Gay-Lussac have shown this year that there is one more to add to this class—the acids called *prussic* by M. de Morveau, because it enters into the composition of Prussian blue; and its radical not being then known, it was not possible to give it a name from that substance.

The experiments of Margraaf, Bergman, and Scheele, demonstrated that in Prussian blue the iron was united to a substance which acted the part of an acid. Berthollet has long suspected that no oxygen entered into its composition, but merely carbon, azote and hydrogen. The truth of this suspicion has been ascertained by Gay-Lussac.

On decomposing, with the precautions which he indicates, the prussiate of mercury by muriatic acid, he obtained pure prussic acid; and we have already in one of our preceding reports spoken of the singular properties which he ascertained it to possess in that state, particularly its great volatility. Burning this vapour by means of oxygen and the electric spark, he obtained determinate quantities of water, carbonic acid, and azote. He abstracts the oxygen consumed in the formation of the first two bodies, and obtains this conclusion, that one volume of the vapour of prussic acid results from the combination and concentration of one volume of the vapour of carbon, half a volume of azote, and half a volume of hydro-

gen; or, expressing these volumes in weight, according to the density of the vapours, 100 parts of the acid contain,

Carbon	44·39
Azote	51·71
Hydrogen	3·90
	100·00

This prussic acid contains more azote and less hydrogen than other animal substances, from which it is particularly distinguished by the absence of oxygen.

This is the first known hydracide with a decomposable base. Gay-Lussac has likewise succeeded in obtaining this radicle in a separate state. The accidental name *prussic* not being proper, he has given it the name of *cyanogen* (that is, *producing blue*). Henceforth prussic acid must be called *hydro-cyanic acid;* its saline compounds, *hydro-cyanates;* and the compounds of its radical, *cyanurets.*

We wish it were in our power to give an account of the numerous and delicate experiments by which Gay-Lussac has reduced under the one or the other of these classes, the different products of the action of prussic acid upon bodies, and the properties which he has recognized in them. Let it suffice to say, that Prussian blue rather appears to him a cyanuret of iron containing water than a *hydro-cyanate*, or to use the old name, a *prussiate.*

Cyanogen itself possesses peculiar properties. It is a permanently elastic fluid, of the specific gravity 1·8064, having a peculiar and strong odour, giving a sharp taste to water, and burning with a purple flame. Water absorbs four times its volume of it, and alcohol twenty-three times its volume. Its direct analysis gave the same results as that of hydrocyanic acid, namely one volume of vapour of carbon, and half a volume of azote.

Gay-Lussac has likewise presented to the class, memoirs on the cold produced by evaporation, and on evaporation in air of different degrees of temperature and density, in which he expresses by a formula the result of his experiments. He has, likewise, given a memoir on hygrometry, containing the

immediate consequences of these experiments; but these works not having, in his opinion, acquired that precision and order which he is accustomed to give to all that he publishes, the author has thought proper to defer the printing of them.

M. Dulong, professor at Alfort, has presented some experiments on oxalic acid, which, though not constituting a complete work, open interesting views for the science. When this acid is saturated with barytes, strontian, or lime, we obtain always salts, which represent the acid employed even when they have been exposed to a heat higher than that of boiling water. But with oxide of lead, or of zinc, we always lose 20 per cent. of the acid by drying. When these metallic salts are afterwards strongly heated, no water makes its appearance; but we obtain carbonic acid and carbonic oxide, and there remains behind the oxides of the metals employed, of which that of lead possesses particular properties. The oxalates of copper, silver, and mercury, on the contrary, always give out water when decomposed, how dry soever they are previously made. Carbonic acid is likewise given out, and the base remains in the metallic state. The oxalate of silver detonates, and we know already that it detonates when struck, as well as the oxalates of mercury.

As to the oxalates of barytes, strontian, and lime, they give, when decomposed by heat, empyreumatic oil, water, carbonic oxide, carburetted hydrogen, carbonic acid, and there remains a mixture of subcarbonate and charcoal.

These phenomena may be explained two ways. Oxalic acid is either composed entirely of carbon and oxygen, in proportions intermediate between those of carbonic acid and carbonic oxide; but it contains water, which certain oxalates, as those of lead and zinc, lose when dried; while others retain it. Or it is a compound of carbonic acid and hydrogen. This last constituent, with the oxygen of the oxide, will form water, which these first oxalates likewise allow to escape, and nothing remains but carbonic acid and the metal, a combination quite new in chemistry: for it is regarded as a general principle, that metals are capable of uniting with acids only after being oxydised. M. Dulong, who is inclined to this last explanation, conceives of course, that the dried oxalates of lead and zinc

are not real oxalates, and he proposes to give to them, as well as to similar compounds that may be discovered, the name of *carbonides*. The oxalates which do not give water by drying, contain the oxalic acid entire; and as from its composition it will be named hereafter *hydro-carbonic*, the salts will take the name of *hydro-carbonates*.

M. Dulong is led by analogy to very general conclusions, by which he reduces under the same laws, not only the ordinary acids, but likewise the hydracids. But we shall give a more detailed account of his opinions, when he sends up the memoir in which he intends to consign them.

The chemical action of solar light on bodies is worthy of all the attention of philosophers, from its influence on most of the phenomena of living nature; yet it has hitherto been but little examined. M. Vogel has just added some experiments to those which we formerly possessed. Ammonia and phosphorus, which do not act on each other in the dark, when exposed to the solar light disengage phosphoretted hydrogen gas, and deposit a black powder composed of phosphorus and ammonia intimately united. Nearly the same thing takes place with phosphorus and potash. The action of the different rays are not always similar, the red rays produce no effect on the solution of corrosive sublimate in ether, while the blue and complete light produce a mutual decomposition. The metallic permuriates are brought in the same way to the state of protomuriates.

We have said a few words in our two last reports on the researches of M. Chevreul, assistant naturalist to the Museum of Natural History, concerning soap and saponification. This skilful experimenter has ascertained that the action of potash on tallow produces new modes of combination; from which result substances which did not exist before perfectly formed, and two of which, margarine and a species of fluid oil, acquire all the properties of acids. The author, pursuing his experiments, has ascertained that the same effects are produced by soda, the alkaline earths, and different metallic oxides, and that the resulting substances are in the same proportion, whatever agent we have employed. Magnesia and alumina, on the contrary, merely contract a certain union with tallow, without se-

parating its elements into two distinct bodies. The quantity of alkali necessary to convert a given portion of tallow into soap is exactly that which saturates the margarine and oil which the tallow produces. Our laborious chemist has terminated his memoirs on this subject, by giving the capacity of saturation of margarine and fluid tallow, and by describing the properties of several new soapy combinations which he produced by double decompositions, by mixing a hot solution of soap, of fluid tallow, and potash, with different earthy and metallic salts. Thus he has rendered the soaps, the study of which has been hitherto neglected, almost as well known as the salts with which chemists have been the most occupied.

The late M. Fourcroy made known, under the name of *adipocire*, a substance separated by means of acids from the fatty matter into which animal bodies buried in the earth are converted. And he considered it as identical with the crystalline matter in human biliary calculi, and with the spermaceti found abundantly in certain cavities of the head of the Cachalot.

M. Chevreul, led by his experiments to examine these substances, has found that the crystalline matter of biliary calculi does not form soap, while spermaceti furnishes it as easily as tallow; but producing a somewhat different alteration in other proportions and with particular properties. The fatty matter of dead bodies is much more compound than Fourcroy had supposed, containing different fatty bodies combined with ammonia, potash, and lime. It is a fatty matter that has already experienced the action of alkalies.

Every person must have observed a resinous excretion of a yellowish-orange colour, which exudes from cracks in the bark of the beech faggots exposed to moisture. It has the shape of ribbons, twisted like vermicelli. M. Bidault de Villiers has made some chemical experiments on this matter. One portion of it dissolves in water, another in alcohol, and the residue possesses some of the properties of gluten. Nitric acid converts it into oxalic acid, into a yellowish bitter principle, which is very abundant, and into a fatty matter; but produces no saclactic acid. When heated it gives abundance of carbonate of ammonia, and a fetid oil; so that the commission-

ers of the class were led to consider it as approaching very closely to an animal substance. It would be interesting to inquire into the cause of its production.

One of the periods in which chemistry has shown itself most brilliant and most useful, was certainly that in which France, separated for twenty years from countries whose productions had been considered for so long a period as real necessaries, was obliged to supply them by the products of its own soil. The known arts have been perfected and new ones created. We have seen in succession soda extracted from common salt; alum and copperas formed by uniting their ingredients; colours considered as fugitive rendered permanent; indigo from woad supplying that from the indigofera; madder supplying the place of cochineal; and sugar from beet employed as a substitute for that from the sugar cane.

This last article, the most important of all, is far from having lost its interest even at present. Many of the manufactories, indeed, have fallen; but those which were properly conducted still subsist and prosper; and according to M. le Comte Chaptal, their product will always be able to rival the sugar of the colonies. This skilful chemist gives an unanswerable proof of his assertion by continuing to manufacture with profit. It is true that in all the details of the culture, harvest, and preparation, and likewise in the employment of the different waste matters, he has applied all the lights of science and experience, so as never to throw away what can be of any service, and to apply to other uses what he is obliged to reject. He has described his processes in a manner sufficiently clear to be understood by all the manufacturers, and we have reason to hope that his work will assist in preserving to France a precious manufacture, which a thousand events may again render necessary to the country.

The third volume of the Elementary Chemistry of Thenard has been published. This skilful professor describes in it with great minuteness, and according to the most recent discoveries, for many of which the science is indebted to himself, the immediate principles of organized bodies, the different products of their decompositions, and their uses in the arts. The fourth, which is in the press, will terminate the work.

Professor LOEBEL's *Observations upon the Benefit of Insolation in different Complaints, particularly in Cases of the Amaurosis.*

[From the London Medical and Physical Journal, for Feb. 1816.]

THE physicians of former times cured different complaints by exposing the suffering parts to the action of the sun-beams, and practised this method particularly in disorders of the lymphatic system, such as different kinds of dropsy, and the gout. Professor Loebel has proved, in a dissertation, that insolation is with injustice neglected at present. According to his opinion the effects of insolation upon the suffering organs are the following:

1. The warmth of the sun increases the activity of the lymphatic system, and of the vessels.

2. By the influx of light, the vital activity is roused and heightened both in the afflicted part and the whole body.

3. The development of oxygen, or vital air, caused by the action of the sun, also operates chemically upon the organization.

For these reasons, M. Loebel recommends insolation in the following cases :

1. In chronic anasarca, not founded upon any organic defect, where the extremities feel cold, and a general weakness and torpor appears in the lymphatic system, particularly in metastatic exanthema, after repelling the tinea capitis, the itch, or herpes, or after an ill-managed scarlatina.

2. In the chronic gout, particularly when all the organs are suffering by its long duration, when contractions, tumores ossium, and insupportable pains prevail, also where the gout leaves a partial palsy.

3. In all complaints attacking the tractus intestinorum, such as chronic spasms of the stomach, where weakness in the nervous system prevails, and in chronic diarrhœa; as also in the fluxus cœliacus and hepaticus, in chronic catarrh and chronic erysipelas.

4. In different forms of venereal complaints, in particular during the use of mercurials, when it serves to heighten and increase the effect upon the lymphatic system and the skin.

5. In diseases of the bones, tumores ossium, and in general or partial caries.

6. In subjects weakened by immoderate venery.

7. In nervous apoplexy, and palsy of single parts.

8. In the nervous gout of the head.

9. Against aphony when the incapacity of speaking is transitory, and not occasioned by the destruction of the organs.

10. In the marasmus senilis.

11. In the palsy of the lower extremities; particularly where the nervi crurales have suffered, and a state of inactivity and want of irritability prevails in them.

12. In amaurosis, from idiopathic causes, and from weakness of the retina or ciliary nerves, or when a palsied state of the optic nerve produces this complaint, or when it arises from a metastasis of gouty, venereal, or itchy matter.

Contra indications of the method of cure are the following:

a. In all diseases where an exalted irritability or plethora prevails, insolation must not be applied.

b. Neither in acute violent inflammations, general nor local; in affections of the lungs, which show a disposition to inflammations, spitting of blood, or congestion.

c. Apoplexy, the nature of which consists in a congestion.

d. In hemorrhages both of the active and passive kind, insolation is improper.

e. Insolation must absolutely be refrained from where the patient shows an idiosyncrasy or apathy against this method of cure, or by persons whose nerves, when in health, were found too sensible of the action of light or sun-beams, and who felt head-ach or vertigo on the slightest action of sun-shine.

Manner of application.—1. This method of cure must not be applied in stormy or moist weather, or when east, west, and north winds prevail. Insolation requires calm days.

2. The patient during insolation must not sit or lie on the bare ground, but a leather skin must be placed under him, as was the custom of the Greek and Roman physicians.

3. Insolation must neither be applied on an empty stomach, nor directly after dinner; but, if the complaint requires the application during noon-tide, it is advisable to let the patient previously take a little food.

4. If insolation is to be performed on single suffering parts, the rest of the body must be covered with a white linen cloth, and only that part exposed on which the sun-beams are to act.

5. Insolation must be adapted to the different cases: in one case half an hour or an hour is requisite, in others a period of some hours. Again, in some cases the rays of the morning sun, in others the most powerful rays of noon or afternoon are necessary, according to circumstances and individuality. In complaints of the eyes, viz, in amaurosis, Mr. Loebel advises to shut the eye-lids, and to let the sun-beams act through half convex glass, placed upon the eyes thus shut.

Mr. Loebel gives the following directions for a particular machine which he calls a sun-bath. It consists of a box entirely constructed of panes of glass, about three feet long, nearly in the form of a hot-bed, the bottom to be of wood covered with sole-leather, the sides about three or four feet in height, of panes of glass. In the upper part, an opening for the patient to put his head through; on one side a glass door by which to enter; and the bottom must be covered with very dry sand, or kitchen salt, about a quarter of a yard high. This box must then be exposed to the sun, so that the beams, thus more concentrated by the panes of glass, may produce a stronger effect upon the subject enclosed; for which reason there ought also to be glass doors in the machine, that the degrees of heat may either be increased or lessened. The preference of this sun-bath to the usual method of insolation amongst the ancients consists in the more effectual application of the sun-beams upon the naked body, in proportion to the complaint, and according to the will of the physician; and, in case the perspiration of the patient takes place, the risk of catching cold is thereby absolutely prevented. The effect of the heat must also be far more powerful and concentrated than can be the case by pursuing the ancient method. Besides, the ancient method cannot always be applied either in England or the northern parts of Germany, without risk to the patient, on account of the instability of the atmosphere; but the sun-bath recommended here may, with proper precaution, be applied more frequently and with greater confidence.

6. Finally, insolation must not be applied alone, but combined

with those remedies adapted and prescribed for every form of sickness, as many cases require not only inward medicines, but also outward applications, such as frictions, &c.

Professor Loebel communicates the following remarkable cure of an amaurosis by applying local insolation.

J. S., a native of Dresden, forty years of age, had served from his nineteenth to his thirty-fifth year in the Saxon infantry, and amongst other excesses had profusely indulged in venery. When thirty-seven years old, he suffered much from the gout, but was restored. About two years after, he was seized with nervous apoplexy, which palsied his whole right side: he was also cured of this complaint, but it left a weakness in the organs of sight, which, in 1809, amounted to amaurosis in his right eye; by his left he saw, as he expressed himself, only as through a gauze. In 1810 he consulted Mr. Loebel, who, on close examination, was convinced that this amaurosis, the consequence of a complaint in the *nervi ciliares*, was connected with a weakness general to the whole organ. He therefore gave him a number of stimulating and nervous remedies internally and locally. Among the rest, very small doses of phosphorus. Under this management, the sight of the left eye was sensibly improved, and the gauze-like film disappeared; but the right eye, notwithstanding the inward and outward application of phosphorus, remained insensible, and the pupilla remained immoveably enlarged, and paralysed. He now resolved to apply local insolation, along with the use of the following prescription:

℞. Rad. Valer. Pulv. ʒijss.
Caryophyl. Arom. ϑj.
Cortic. Cinnam. ʒss.
Spir. Vin. Gall. Opt. ℥iv.

To be taken, a table-spoonful every two hours. For this purpose he fixed a silver wire round what is called a burning-glass, and, by means of ribbons fastened to each side, tied this convex glass upon the eye afflicted with the amaurosis; then caused the rays of the meridian sun to operate through this glass, at first, only for half an hour. He directed the patient to shut his eye-lids during the insolation, and ordered the other parts of the head to be covered with a white linen cloth. The phosphoric infrictions were now laid aside, but the use of the above-

mentioned medicine continued. The insolation was repeated twice a-day, for half an hour before and three-quarters of an hour after, dinner. The patient was not suffered to open his eye-lids directly after the insolation, but only an hour afterwards, and then only in a darkened, though not quite dark, room. After having proceeded thus for a fortnight, he found the iris to have acquired more power of motion, and the patient, at the same time, complained of an itching sensation in the afflicted eye, but could merely discern the motion of the hand before the same. Mr. Loebel continued the insolation, and had the satisfaction of seeing his patient in a short time cured of his amaurosis. He could discern every object, and distinguish all his acquaintances that came to visit him: however he could not read any printed or written characters, nor could all Mr. Loebel's art bring his patient so far as to enable him to read a book with his right eye.

From subsequent foreign journals we make the following extract:—

A very ingenious oculist, Professor WEINHOLD, M. D. at Merseburg, has published the following remarks in recommendation of the use of Insolation upon the torpid Retina, in the Jena Literary News, Merseburg, Oct. 4, 1815.

"I fully coincide in recommending insolation through *half-convex* glasses, having, in quality of practical physician and oculist, frequent occasions to observe the danger attending the use of the common burning glass. For this reason I commonly cause large burning glasses to be cut into halves, or cover them half with black paper, by which means the dangerous focus is avoided.

Insolation proved disadvantageous in the amauroses accompanied by a heightened irritability, but advantageous in that attended with torpor, or, as the ancients say, *sine materia*, of course, in the amaurosis the consequence of nervous complaints, unattended with gout, lues venerea, or psora."

Flora of South Carolina and Georgia.

PROPOSALS have been issued in Charleston, (S. C.) for publishing, by subscription, a work on the Botany of South Carolina and Georgia, by Stephen Elliot, Esq. of Charleston. This

work will be published in numbers, which will not exceed ten. The first number will be published in May or June, and the subsequent numbers at intervals of two months each. The price to subscribers will be a dollar each number. The work will include all such plants as the author has seen himself, and also those which have been described by botanists on whose authority he can rely. It will contain, occasionally, observations on the medical and economical uses of the plants described, their popular names, where they can be ascertained, and some notices of the insects which they support, and by which they are destroyed.

The friends of natural history will anticipate with much pleasure the appearance of this work, which is to embrace the productions of a tract of country, exuberant in its vegetation, and highly interesting to botanists. The name of Mr. Elliott is not unknown to the scientific world, and high expectations may be placed on his able execution of the undertaking he has announced. His fondness and zeal for the science may be estimated from the following passage, which we extract from an address delivered before the Literary and Philosophical Society of South Carolina, of which he is president.

"The study of natural history," says he, "has been for many years the occupation of my leisure moments; it is a merited tribute to say that it has lightened for me many a heavy, and smoothed many a rugged hour; that, beguiled by its charms, I have found no road rough or difficult, no journey tedious, no country desolate or barren. In solitude never solitary, in a desert never without employment; I have found it a relief from the languor of idleness, the pressure of business, and even the unavoidable calamities of life."

Translation of Boyer's Surgery.

Dr. Stevens, professor of Surgery in the Medical Institution of New-York, has undertaken the task of translating the late work of Baron Boyer. This valuable publication is a treatise on surgical diseases, without the operations; for although the title might convey the idea of a work on operative surgery, the author disclaims a pretension to this, and refers to others,

for instruction in the use of the knife. It was originally published in four volumes; but the intention of the translator is to compress it into two. No other modern work, in our possession, enters so exactly into the details of surgical treatment: and although the author's minuteness may sometimes appear fatiguing, his patient description of the phenomena and treatment of this class of diseases assists us in a part of practice where others forsake us.—Dr. Stevens has published one volume of his translation, containing two of Boyer's.

Dr. Wilson of New-Hampshire has lately published "An Inquiry into the Nature and Treatment of the prevailing Epidemic called Spotted Fever." This volume contains about 200 pages, and is divided into three parts. The first part contains a general view of the climate and diseases of the United States. The second is an inquiry into the nature of this epidemic. The third comprises the treatment.

Gum Kino.

In the appendix to the life and last journal of Mungo Park, lately published, it appears that this drug, whose origin has hitherto been unknown, is found, from a specimen sent by him to Europe, to be obtained from a species of *Pterocarpus*, not yet described by any botanical writer.

Dr. Granville has nearly ready for publication, a translation of that part of Orfila's general Toxicology which more particularly relates to poisons from the vegetable and animal kingdoms. The subject having formed a very immediate branch of Doctor Granville's scientific pursuits, he has been enabled to accomplish his translation with copious notes and additions.

Dr. Adams is preparing for the press, Memoirs of the Life, Doctrines, and Opinions of the late John Hunter, founder of the Hunterian Museum, at the College of Surgeons in London. These Memoirs are carefully collected from authentic documents and anecdotes, and also from the writings, lectures, and conversations of the deceased.

College of Physicians of Philadelphia.

JULY 2d, 1816.

The following officers of the College were this day duly elected.

President.

Doctor Adam Kuhn.

Vice President.

Doctor Thomas Parke.

Censors.

Doctor Caspar Wistar,
Samuel P. Griffitts,
William Currie,
Thomas T. Hewson.

Treasurer.

Doctor Thomas C. James.

Secretary.

Doctor Joseph Parrish.

PENNSYLVANIA HOSPITAL.

Patients remaining in the house April 22, 1815 -	146	
admitted from that time to April 27, 1816	681	
		827
Of these the number Cured is - -	397	
Relieved -	72	
Removed - -	56	
Children born in the house	11	
Eloped - -	37	
Died - -	66	
Remain - -	188	
		827

Out-Patients.

Cured - -	891	
Relieved - -	39	
Disorderly - -	30	
Delivered - - -	2	
Died - -	138	
Remain - -	132	
		1132

PENNSYLVANIA HOSPITAL.

MAY 13th, 1816.

The following Physicians were chosen for the ensuing twelve months:

Doctors Thomas Parke,
P. S. Physick,
John Syng Dorsey,
Joseph Hartshorne,
John C. Otto,
Samuel Calhoun.

For the Lying-in Department,
Dr. Thomas C. James.

For Out-Patients,
Dr. John W. Moore.

JUNE 24.—Dr. Joseph Parrish was elected physician to the Pennsylvania Hospital, in the place of Dr. Physick, resigned.

UNIVERSITY OF PENNSYLVANIA.

MAY 11th, 1816.

AT an extra-commencement held this day, the degree of Doctor of Medicine was conferred on DANIEL DRAKE, of Cincinnati, in the state of Ohio.

METEOROLOGICAL OBSERVATIONS.

State of the weather at Philadelphia during the first six months of 1816.

January.

Thermometer—Lowest, at 8 A. M. 6. 15th of the month.
Highest, at 3 P. M. 46. 23d.
Mean, ... 30.

Winds—northerly and westerly—Delaware frozen on the 9th, and broke up on the 24th—several snows.

February.

Thermometer—Lowest, at 8 A. M. 8. 9th and 15th days of the month.
Highest, at 3 P. M. 58. 4th.
Mean, ... 32.

Winds—southerly and westerly, for the most part—not much rain—no snow—a mild month.—A severe earthquake on the second inst. about one o'clock P. M. at Lisbon, and one early in the morning of the same day at Madeira—duration from 3 to 4 minutes at each place.

March.

Thermometer—Lowest, at 8 A. M. 14. 8th day of the month.
Highest, at 3 P. M. 70. 27th.
Mean, ... 40.

Winds—variable—chiefly northerly and westerly.—Three or four snows this month; little rain.—Ice-islands met with off the coast on the 31st.—Earthquake in England on the 17th.

April.

Thermometer—Lowest, at 8 A. M. 33. 16th day of the month.
Highest, at 3 P. M. 75. 27th and 29th.
Mean, ... 45.

Winds—westerly winds prevailed—the last three weeks of the month dry.—Ice in the gutters on the 16th.—The newspapers of this month mention the existence of the plague at Naples.—Spots in the sun appeared in this and the following month.

MAY.

Thermometer—Lowest, at 8 A. M. 38. 16th day of the month.
Highest, at 3 P. M. 76. 22d and 31st.
Mean, ... 58.

Winds—westerly most prevalent—an uncommonly dry, cool month—some snow on the 24th.—Shad large but not so plentiful as common.—Locusts in North and South Carolina, and in Georgia, in this and last month.—An earthquake on the first day of the month at New York.—The bank of the Mississippi gave way near New Orleans, and the city was inundated to an extensive degree.

JUNE.

Thermometer—Lowest, at 8 A. M, 50. 7th day of the month.
Highest, at 3 P. M. 90. 14th.
Mean, ... 70.

Winds variable—westerly and easterly most prevalent—weather alternately hot and cold—refreshing rains—some heavy thunder.—The coldness and dampness of the preceding months have been injurious to vegetation—but there is a prospect of a good harvest in many places—Fruit abundant—heavy snows in Vermont, Massachusetts and Canada.—Hæmoptoe unusually prevalent here in the beginning of the spring. Intermittents, of a common mild character, and acute rheumatism, frequent throughout the spring—Erysipelas uncommonly prevalent in May and June—small pox continues—measles ands carlatina have occurred for some time past, though not to any considerable degree.

RECENT BRITISH PUBLICATIONS.

Medicine, Surgery, &c.

Lectures on Inflammation, exhibiting a view of the General Doctrines, pathological and practical, of Medical Surgery. By John Thomas, M.D. F.R.S.E. Professor of Surgery in the Royal College of Surgeons, &c.

An Essay on the Yellow Fever, with observations concerning Febrile Contagion, Typhus Fever, Dysentery and the Plague; partly delivered at the Gulstonian Lectures before the College of Physicians, in the years 1806 and 1807. By Edward Nathaniel Bancroft, M. D. Fellow of the Royal College of Physicians, &c.

Reports of the pestilential disorder of Andalusia which appeared at Cadiz, in the years 1800, 1804, 1810 and 1813, with a detailed account of that fatal epidemic, as it prevailed at Gibraltar, during the autumnal months of 1804, &c. By Sir James Fellowes, M.D. F.R.S.E. and Fellow of the Royal College of Physicians London, &c. &c.

A Practical and Historical Treatise of Consumptive Diseases, deduced from Original Observations, and collected from authors of all ages. By Thomas Young, M.D. F.R. and L.S. Fellow of the Royal College of Physicians, &c.

A Treatise on Forensic Medicine, or Medical Jurisprudence. By O. W. Parthy.

Elements of Pathology and Therapeutics; being the outlines of a work intended to ascertain the Nature, Causes and most efficacious modes of prevention and cure of the greater number of diseases incidental to the human frame; illustrated by numerous cases and dissections. By Caleb Hillier Parry, M.D. F.R.S. &c. Vol. I. General Pathology.

A critical Inquiry into the Pathology of Scrofula; in which the origin of that disease is accounted for on new principles; and a new and much improved method is recommended and explained for the treatment of it. By George Henning, M.D.

A correct Translation of the newly corrected Pharmacopœia, of the London College of Physicians. By Richard Reece, M.D.

An Inquiry into the Causes of the Motion of the Blood, with an appendix; &c. By James Carson, M.D. &c.

A General System of Toxicology, or a Treatise on Poisons, &c. By M. P. Orfila, M.D. of the faculty of Paris, Professor of Chemistry, &c.

Observations on the Cure of Cancer, &c. By the late Thomas Denman, M.D. &c.

Medico-Chirurgical Transactions, Vol. VI.

Medical Transactions of the College of Physicians London, Vol. V.

An Epitome of Juridical, or Forensic Medicine. By Dr. G. E. Male, of Birmingham, 8vo.

An Inquiry into the Nature, Cause and Varieties of the Arterial pulse. By Dr. C. H. Parry, of Bath.

Three Lectures on Craniological Physiognomy, in which the opinions of Drs. Gall and Spurzheim are controverted; in one Vol. 8vo. with Engravings.

Natural History and Botany.

Flora Londinensis, by the late William Curtis; enlarged and continued by George Graves, F.L.S. and William Jackson Hooker, F.R. and L.S. Royal folio, Part I. to VI.

A Treatise on the Nature, Œconomy and Practical Management of Bees, &c. &c. By Robert Huish, of the Imperial Apiarian Society of Vienna.

A System of Physiological Botany. By the Rev. P. Keith, F.L.S. &c. 2 Vols. 8vo.

Transactions of the Geological Society, 4to. Vol. 2.

An Elementary Introduction to the Knowledge of Mineralogy, &c. By William Phillips.

Ovarium Britannicum. By George Graves, F. L. S. Part I. R oyal 8vo.

Ornithology. By George Graves, F.L.S. 2 Vols. Royal 8vo.

Transactions of the Linnæan Society of London, Vol. XI. Part II.

A Descriptive Catalogue of the British Specimens, deposited in the Geological Collection of the Royal Institution. By William Thomas Brande, F.R.S. 8vo.

Natural History of British Birds, &c. Vol. VI. and VII.

A Treatise on the Natural History, Properties and Use of Coffee.

American Publication.

Lieutaud's Synopsis of the Universal Practice of Medicine. Translated By Edwin A. Atlee, M.D. Fellow of the College of Physicians of Philadelphia.

LITERARY INTELLIGENCE.

Edward Earle proposes to publish Park's Chemical Essays, and Henry's Chemistry.